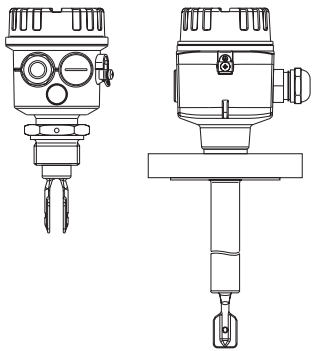
Level | Pressure | Flow | Temperature | Liquid Analysis | Registration | Systems Components | Services | Solutions

Operating Instructions

Liquiphant M FTL50, FTL51



de – Füllstandgrenzschalter
en – Level Limit Switch
fr – Détecteur de niveau
es – Detector de nivel
it – Interruttore di livello
nl – Niveauschakelaar

KA143F/00/a6/03.06
52002410

Endress+Hauser
People for Process Automation

de - Inhalt

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fr - Sommaire

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Achtung!
= verboten;
führt zu fehlerhaftem Betrieb oder Zerstörung.

Caution!
= forbidden;
leads to incorrect operation or destruction.

Attention!
= interdit; peut provoquer des dysfonctionnements ou la destruction.

es - Indice

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it - Indice

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nl - Inhoud

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Atención!
= Prohibido; peligro de mal funcionamiento o de destrucción.

Attenzione!
= Vietato; pericolo di malfunzionamento o di distruzione.

Opgelet!
= verboden; leidt tot foutieve werking of storing.

de - Sicherheitshinweise

Der Liquiphant M FTL50, FTL51 darf nur als Füllstandgrenzschalter für Flüssigkeiten verwendet werden.
Bei unsachgemäßem Einsatz können Gefahren von ihm ausgehen.
Das Gerät darf **nur von qualifiziertem und autorisiertem Fachpersonal** unter strenger Beachtung dieser Betriebsanleitung, der einschlägigen Normen, der gesetzlichen Vorschriften und der Zertifikate (je nach Anwendung) eingebaut, angeschlossen, in Betrieb genommen und gewartet werden.
In der Gebäudeinstallation ist ein Netzschalter für das Gerät leicht erreichbar in dessen Nähe zu installieren.
Er ist als Trennvorrichtung für das Gerät zu kennzeichnen.

en - Notes on Safety

The Liquiphant M FTL50, FTL51 is designed for level limit detection in liquids.
If used incorrectly it is possible that application-related dangers may arise.
The level limit switch Liquiphant M FTL50, FTL51 may be installed, connected, commissioned, operated and maintained **by qualified and authorised personnel only**, under strict observance of these operating instructions, any relevant standards, legal requirements, and, where appropriate, the certificate.
Install an easily accessible power switch in the proximity of the device.
Mark the power switch as a disconnector for the device.

fr - Conseils de sécurité

Le Liquiphant M FTL50, FTL51 doit être exclusivement utilisé comme détecteur de niveau pour liquides.
Il peut être source de danger en cas d'utilisation non conforme aux prescriptions.
L'appareil ne doit être installé, raccordé, mise en service et entretenu **que par un personnel qualifié et autorisé**, qui tiendra compte des indications contenues dans la présente mise en service, des normes en vigueur et des certificats disponibles (selon l'application).
Installer un commutateur réseau à proximité immédiate de l'appareil, en veillant à ce qu'il soit facilement accessible.
Marquer ce commutateur comme prise de coupure de l'appareil.

es - Notas sobre seguridad

El detector de nivel Liquiphant M FTL50, FTL51 ha sido diseñado para la detección de límite en fluidos.
Su empleo inapropiado puede resultar peligroso.
El equipo deberá ser montado, conectado, instalado y mantenido **única y exclusivamente por personal cualificado y autorizado**, bajo rigurosa observación de las presentes instrucciones de servicio, de las normativas y legislaciones vigentes, así como de los certificados (dependiendo de la aplicación).
Instalar un interruptor de fácil acceso en las proximidades del equipo.
Identificar el interruptor como desconectador del equipo.

it - Note sulla sicurezza

Il Liquiphant M FTL50, FTL51 è particolarmente studiato per l'impiego come soglia di livello in liquidi.
Un'installazione non corretta può determinare pericolo.
Lo strumento può essere montato **solamente da personale qualificato ed autorizzato**.
La messa in esercizio e la manutenzione devono rispettare le indicazioni di collegamento, le norme e i certificati di seguito riportati.
Installare un interuttore per l'alimentazione in prossimità del dispositivo.
Marcare l'interuttore come disconnessione del dispositivo.

nl - Veiligheidsinstructies

Gebruik de Liquiphant M FTL50, FTL51 alleen als niveauschakelaar voor vloeistoffen.
Indien niet correct gebruikt kunnen gevaarlijke situaties ontstaan.
Het instrument **alleen door gekwalificeerd en geautoriseerd personeel** laten inbouwen, aansluiten, in bedrijf nemen en onderhouden.
Neem de instructies in deze Inbedrijfstellingsvoorschriften, de desbetreffende normen, de wettelijke voorschriften en eventuele certificaten in acht.
Installeer een makkelijk bereikbare voedingschakelaar in de nabijheid van het instrument.
Kenmerk de voedingschakelaar specifiek voor het instrument.

de - Behandlung
Am Gehäuse, Flansch oder Verlängerungsrohr anfassen.

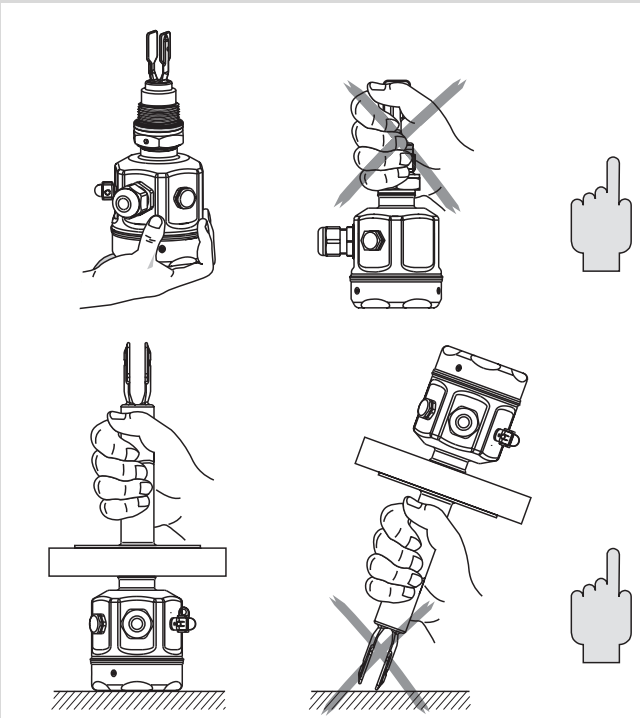
en - Handling
Hold by housing, flange or extension tube.

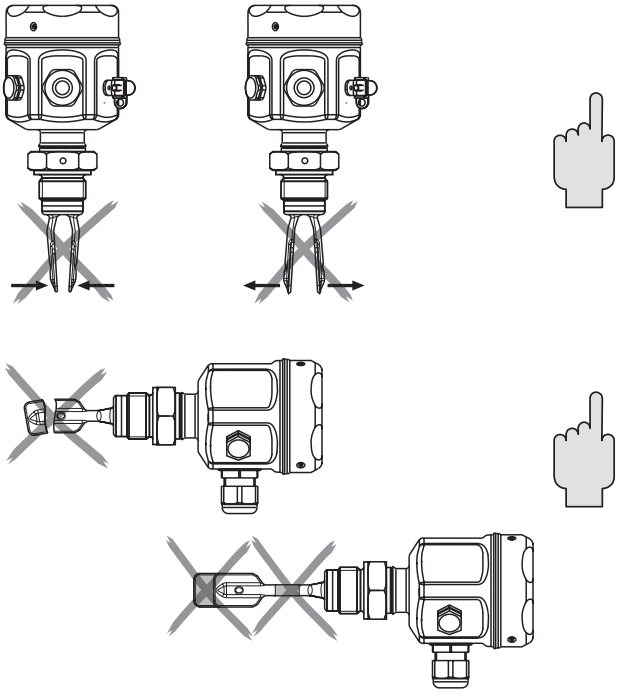
fr - Manipulation
Tenir par le boîtier, la bride ou le tube prolongateur.

es - Modo de empleo
Coger por el cabezal, brida o tubo de extensión.

it - Accorgimenti
Afferrare la custodia, per la flangia o per il tubo di estensione.

nl - Behandeling
Vastpakken via behuizing, flens of verlengbuis.





de – **Nicht** verbiegen
Nicht kürzen
Nicht verlängern

en – Do **not** bend
Do **not** shorten
Do **not** lengthen

fr – **Ne pas** déformer
Ne pas raccourcir
Ne pas rallonger

es – **No** torcer
No acortar
No alargar

it – **Non** stringere o allargare
Non accorciare o allungare
Non piegare

nl – **Niet** verbuigen
Niet inkorten
Niet verlengen

de - Geräte-Identifikation

en - Device Identification

fr - Dénomination

es - Identificación del equipo

it - Identificazione dello strumento

nl - Instrument-identificatie

ENDRESS+HAUSER
LIQUIPHANT M
Order Code
FTL5# ########## ##### mm
in
FTL51
L
A *1
B ATEX II 3 G EEx nC II T6, WHG
ATEX II 3 D T85°C*3
C ATEX II 3 G EEx nA II T6, WHG
ATEX II 3 D T85°C*3
D *1, WHG
E ATEX II 1/2 G EEx de IIC T6, WHG
F ATEX II 1/2 G EEx ia IIC T6, WHG
ATEX II 1/2 D T80°C*3
G ATEX II 1/2 G EEx ia IIC T6
ATEX II 1/2 D T80°C*3
H ATEX II 1 G EEx ia IIC T6
I ATEX II 1/2 G EEx de IIC T6
J ATEX II 1 G EEx ia IIC T6, WHG
K ATEX II 1/2 G EEx d IIC T6
L ATEX II 1/2 G EEx d IIC T6, WHG
P FM IS, Cl. I, II, III, Div. 1, Gr. A-G
Q FM XP, Cl. I, II, III, Div. 1, Gr. B-G, E5 => Gr. A-G
R FM NI, Cl. I, Div. 2, Gr. A-D
S CSA IS, Cl. I, II, III, Div. 1, Gr. A-G
T CSA XP, Cl. I, II, III, Div. 1, Gr. A-G
U CSA General purpose
V TIIS Ex ia IIC T3
W TIIS Ex d IIB T3
X TIIS Ex ia IIC T6
7 TIIS Ex d IIC T3
8 TIIS Ex d IIC T6
Y *2
KA163
KA163

A##
B##
C##
D##
F##
K##
N##
Flansche / Flanges / Brides / Brida / Flangia / Flens → 12 13

GE2	R ¾,	DIN 2999, 316L	max. 100 bar, 150 °C
GE5	R ¾,	DIN 2999, AlloyC4	
GF2	R 1,	DIN 2999, 316L	
GF5	R 1,	DIN 2999, AlloyC4	
GM2	NPT ¾,	ANSI, 316L	
GM5	NPT ¾,	ANSI, AlloyC4	
GN2	NPT 1,	ANSI, 316L	
GN5	NPT 1,	ANSI, AlloyC4	
GQ2	G ¾,	ISO 228, 316L	max. 100 bar, 150 °C
GQ5	G ¾,	ISO 228, AlloyC4	
GR2	G 1,	ISO 228, 316L	
GR5	G 1,	ISO 228, AlloyC4	
GW2	G 1,	ISO 228, 316L	max. 25 bar, 150 °C max. 40 bar, 100 °C
TC2	DN25-38 (1...1½"), Tri-Clamp	ISO 2852, 316L	max. 16 bar, 120 °C
TE2	DN40-51 (2"), Tri-Clamp	ISO 2852, 316L	max. 2 bar, 150 °C
YY9	*[2]		

*[1] ohne / without / sans / sin / senza / zonder

*[2] andere / others / autres / otros / altri / andere

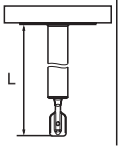
*[3] nicht gültig für PBT / not valid for PBT / non valable pour PBT / no es válido para PBT / non valido per PBT / niet geldig voor PBT

ENDRESS+HAUSER
LIQUIPHANT M

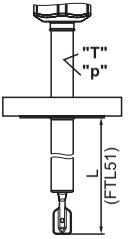
Order Code

FTL51

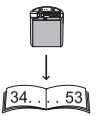
FTL5#_########## #### mm
in



AA	*[2],	Ra < 3.2 µm/80 grit (FTL50)
BB	..... mm, 316L,	Ra < 3.2 µm/80 grit
BE	..... mm, AlloyC4,	Ra < 3.2 µm/80 grit
CB	..... in, 316L,	Ra < 3.2 µm/80 grit
CE	..... in, AlloyC4,	Ra < 3.2 µm/80 grit
DB	"L II", 316L,	Ra < 3.2 µm/80 grit
DE	"L II", AlloyC4,	Ra < 3.2 µm/80 grit
IA	*[2],	+ **"T"** (FTL50)
JB	..... mm, 316L	+ **"T"**
JE	..... mm, AlloyC4	+ **"T"**
KB	..... in, 316L	+ **"T"**
KE	..... in, AlloyC4	+ **"T"**
LB	"L II", 316L	+ **"T"**
LE	"L II", AlloyC4	+ **"T"**
QA	*[2],	+ **"p"** (FTL50)
RB	..... mm, 316L	+ **"p"**
RE	..... mm, AlloyC4	+ **"p"**
SB	..... in, 316L	+ **"p"**
SE	..... in, AlloyC4	+ **"p"**
TB	"L II", 316L	+ **"p"**
TE	"L II", AlloyC4	+ **"p"**
YY	*[2]	



A	FEL50A, PROFIBUS PA
1	FEL51, 19…253 V AC
2	FEL52, 10… 55 V DC, PNP
4	FEL54, 19…253 V AC, 19…55 V DC, DPDT
5	FEL55, 11… 36 V DC, 8/16 mA
6	FEL56, NAMUR, L-H
7	FEL57, PFM
8	FEL58, NAMUR, H-L
9	*[2]



E4	F16,	NEMA4X,	NPT ½	F16 PBT
E5	F13/17,	NEMA4X,	NPT ¾	
E6	F15,	NEMA4X,	NPT ½	
F4	F16,	IP66,	G ½	
F5	F13/17,	IP66,	G ½	
F6	F15,	IP66,	G ½	F13/17 Alu
G4	F16,	IP66,	M20	
G5	F13/17,	IP66,	M20	
G6	F15,	IP66,	M20	
N4	F16,	IP66,	M12	
N5	F13/17,	IP66,	M12	
N6	F15,	IP66,	M12	F15 316L
Y9	*2			

#3 Kompakt-Gehäuse / compact housing / boîtier compact / cabezal compacto / testa compatta / compacte behuizing → KA220

#7 Alu/sep. → KA163

A	*1
C	EN 10204 - 3.1, 316L
N	EN 10204 - 3.1, NACE MR0175, 316L
P	100 bar (FTL51)
R	100 bar, EN 10204 - 3.1, NACE MR0175, 316L (FTL51)
S	GL/ABS marine certificate (FTL51: max. 1600 mm)
Y	*2

*1 ohne / without / sans / sin / senza / zonder

*2 andere / others / autres / otros / altri / andere

"L II" Schaltpunkt / Switchpoint / Point de commutation / Punto de conmutación / Punto di commutazione / Schakelpunt

Liquiphant II FTL 360/365, FDL 30/35

"T" Temperaturdistanzstück / Temperature spacer / Elément de refroidissement / Tramo disipador detemperatura / Distanziale per temperatura / Temperatuurreductiestuk

"p" Druckdichte Durchführung / Pressure sealed bushing / Entrée résistant à la pression / Extensión resistente a la presión / Passacavo a tenutadi pressione / Gasdichte doorvoering

de – Flansche

en – Flanges

fr – Brides

es – Brida

it – Flangia

nl – Flens

ANSI B 16.5

AA2	1¼", 150 lbs, RF, 316/316L	
AB2	1¼", 300 lbs, RF, 316/316L	(FTL51)
AC2	1½", 150 lbs, RF, 316/316L	
AD2	1½", 300 lbs, RF, 316/316L	(FTL51)
AE2	2", 150 lbs, RF, 316/316L	
AE5	2", 150 lbs, RF, AlloyC4 >316/316L	
AF2	2", 300 lbs, RF, 316/316L	
AG2	2", 600 lbs, RF, 316/316L	(FTL51)
AJ2	2½", 300 lbs, RF, 316/316L	(FTL51)
AL2	3", 150 lbs, RF, 316/316L	
AM2	3", 300 lbs, RF, 316/316L	(FTL51)
AN2	3", 600 lbs, RF, 316/316L	(FTL51)
AP2	4", 150 lbs, RF, 316/316L	
AQ2	4", 300 lbs, RF, 316/316L	(FTL51)
AR2	4", 600 lbs, RF, 316/316L	(FTL51)
A82	1", 150 lbs, RF, 316/316L	

EN 1092-1

BA2	DN32,	PN6 A,	316L
BB2	DN32,	PN25/40 A,	316L
BC2	DN40,	PN6 A,	316L
BD2	DN40,	PN25/40 A,	316L
BE2	DN50,	PN6 A,	316L
BG2	DN50,	PN25/40 A,	316L
BH2	DN65,	PN6 A,	316L
BJ2	DN50,	PN100 A,	316L (FTL51)
BK2	DN65,	PN25/40 A,	316L
BM2	DN80,	PN10/16 A,	316L
BN2	DN80,	PN25/40 A,	316L
BQ2	DN100,	PN10/16 A,	316L
BR2	DN100,	PN25/40 A,	316L

B12	DN80,	PN100 A,	316L (FTL51)
B82	DN25,	PN25/40 A,	316L
CA2	DN32,	PN6 B1,	316L
CA5	DN32,	PN6,	AlloyC4 >316L
CE2	DN50,	PN6 B1,	316L
CE5	DN50,	PN6,	AlloyC4 >316L
CG2	DN50,	PN25/40 B1,	316L
CG5	DN50,	PN25/40,	AlloyC4 >316L
CJ2	DN50,	PN100 B2,	316L (FTL51)
CN2	DN80,	PN25/40 B1,	316L
CN5	DN80,	PN25/40,	AlloyC4 >316L
CQ2	DN100,	PN10/16 B1,	316L
CQ5	DN100,	PN10/16,	AlloyC4 >316L
C12	DN80,	PN100 B2,	316L (FTL51)
C82	DN25,	PN25/40 B1,	316L
C85	DN25,	PN25/40,	AlloyC4 >316L
DG2	DN50,	PN40 B1,	316L
DN2	DN80,	PN40 B1,	316L
D82	DN25,	PN40 B1,	316L
FG2	DN50,	PN40 C,	316L
NG2	DN50,	PN40 D,	316L

JIS B2220

KA2	10K 25,	RF,	316L
KC2	10K 40,	RF,	316L
KE2	10K 50,	RF,	316L
KE5	10K 50,	RF,	AlloyC4 >316L
KL2	10K 80,	RF,	316L
KP2	10K 100,	RF,	316L

de – Verwendung
Grenzstanddetektion in Flüssigkeiten

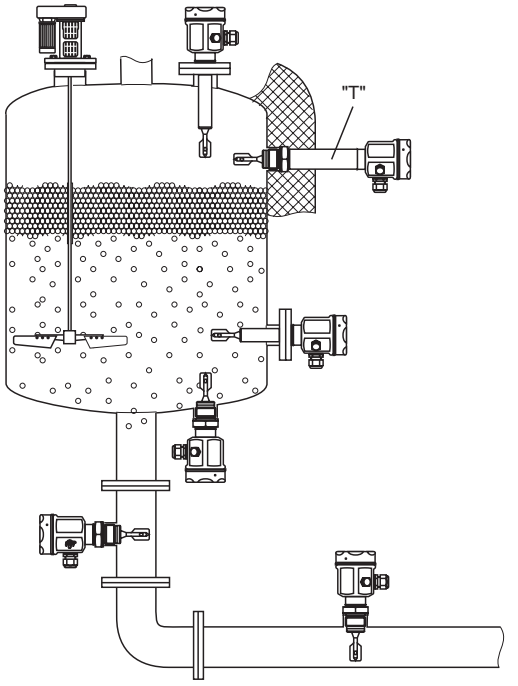
en – Application
Level limit detection in liquids

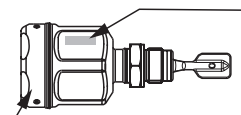
fr – Utilisation
Détection de niveau dans les liquides

es – Aplicación
Detección de nivel en líquidos

it – Applicazione
Controllo livello nei liquidi

nl – Toepassing
Niveaudetectie in vloeistoffen

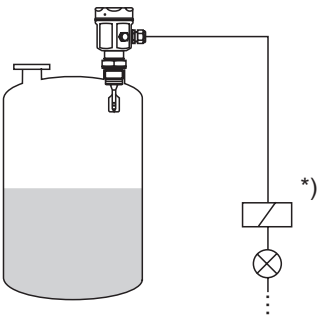




Order code:
FTL5# - # ### ## **#** ## #

Elektronikeinsätze
Electronic inserts
Electronique
Electrónica
Inserti elettronici
Elektronica-insert

FEL5**1**
FEL5**2**
FEL5**4**



*)

*) Externe Last
External load
Charge externe
Carga externa
Carico esterno
Externe belasting

de - Messeinrichtung
für direkten Anschluss

en - Measuring system
for direct connection

fr - Ensemble de détection de niveau
pour raccordement direct

es - Sistema de medida
para conexión directa

it - Sistema di misura
per connessione diretta

nl - Meetopstelling
voor directe aansluiting

de – Messeinrichtung
für Anschluss über Schaltgerät

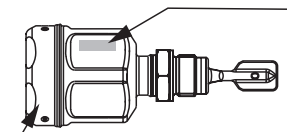
en – Measuring system
for connection via switching unit

fr – Ensemble de détection de niveau
pour raccordement via détecteur

es – Sistema de medida
para conexión vía interruptores

it – Sistema di misura
per connessione mediante unità di commutazione

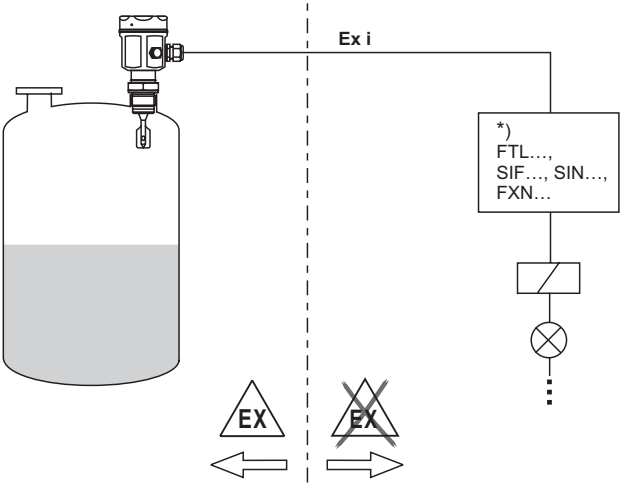
nl – Meetopstelling
voor aansluiting aan een schakelversterker



Order code:
FTL5# - # ### ## **#** ## #

Elektronikeinsätze
Electronic inserts
Electronique
Electrónica
Inserti elettronici
Elektronica-insert

FEL5**5**
FEL5**6**
FEL5**7**
FEL5**8**



*) Schaltgerät, SPS, Trennverstärker
Switching unit, PLC, isolating amplifier
Détecteur, API, convertisseur/ séparateur
Interruptor, PLC, amplificador aislado
Unità di commutazione, PLC, barriera di separazione
Schakelversterker, PLC, scheidingsversterker

de - Messeinrichtung
für Anschluss an PROFIBUS PA

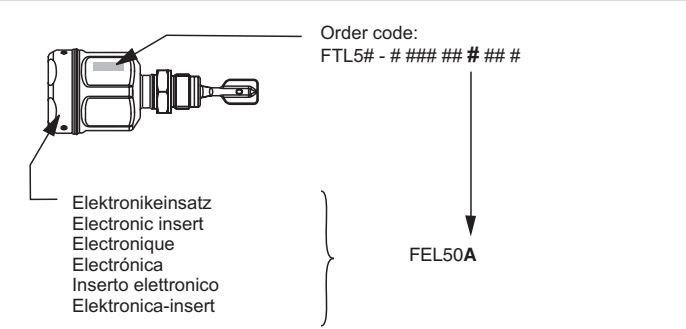
en - Measuring system
for connection to PROFIBUS PA

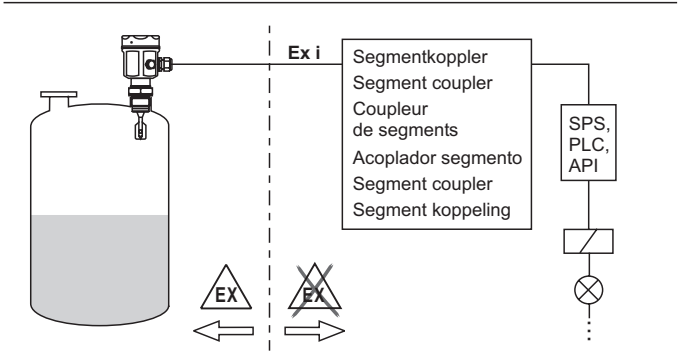
fr - Ensemble de détection de niveau
pour le raccordement à PROFIBUS PA

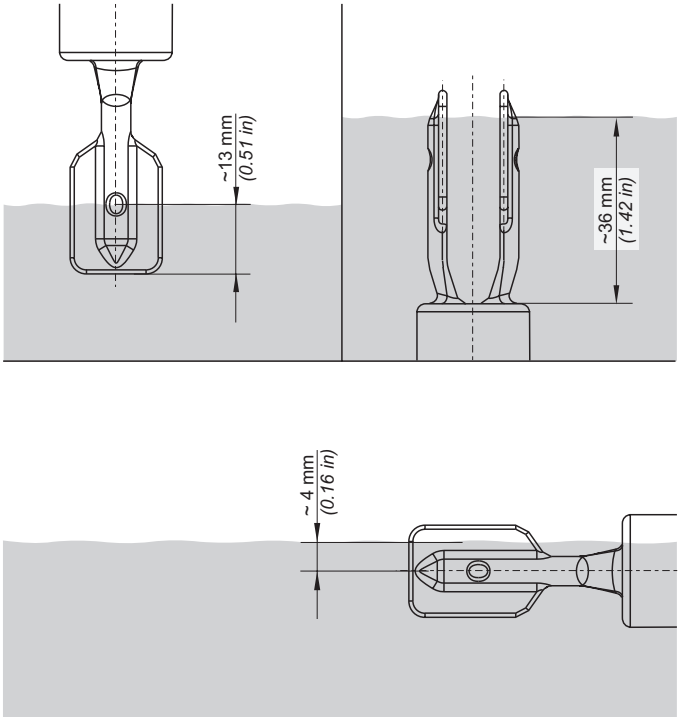
es - Sistema de medida
para conexión a PROFIBUS PA

it - Sistema di misura
per connessione a PROFIBUS PA

nl - Meetopstelling
voor aansluiting aan PROFIBUS PA







de - Einbau
Schaltpunkt in Abhängigkeit vom Einbau

en - Installation
Switchpoint depends on mounting position

fr - Montage
Point de commutation en fonction de l'implantation

es - Montaje
Punto de conmutación dependiendo de la posición de montaje

it - Montaggio
Punto di commutazione in funzione della posizione di montaggio

nl - Inbouw
Schakelpunt afhankelijk van inbouw

de – Einbaubeispiele
in Abhängigkeit von der
Viskosität ν der Flüssigkeit

en – Mounting examples
as a function of liquid viscosity ν

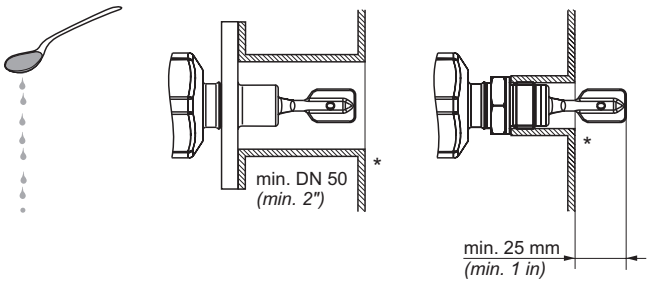
fr – Exemples d'implantation
dépendant de la viscosité ν
du liquide

es – Ejemplos de montaje
dependiendo de la viscosidad ν
del líquido

it – Esempi di montaggio
come funzione di viscosità ν
del liquido

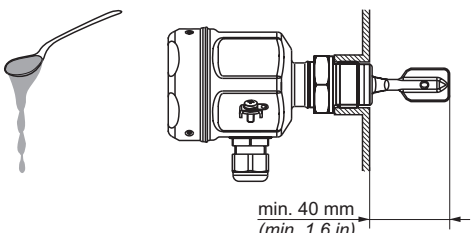
nl – Inbouwvoorbeelden
afhankelijk van de viscositeit ν
van de vloeistof

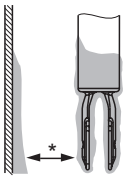
ν = 0…2000 mm²/s
(ν = 0…2000 cSt)

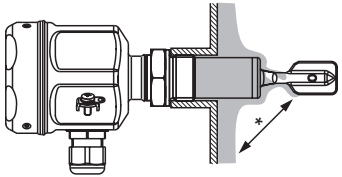


* entgraten / deburr / ébarber / libre / sbavare / ontbramen

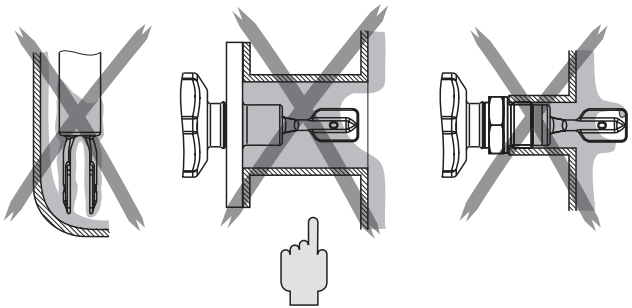
ν = 0…10000 mm²/s
(ν = 0…10000 cSt)







* Abstand! / Distance! / Distance! / ¡Distancia! / Distanza! / Afstand!



de – Ansatzbildung berücksichtigen. Schwinggabel darf Ansatz nicht berühren.

en – Consider build-up. Fork may not contact the build-up.

fr – Tenir compte du colmatage. Fourche ne doit pas entrer en contact avec le dépôt.

es – Tener en cuenta las adherencias. Las horquillas no deben estar en contacto con las adherencias.

it – Tenere conto dei depositi. La forcella non deve entrare in contatto con i depositi.

nl – Rekening houden met aangroei. Trilvork mag de aangroei niet aanraken.

de – Bei dynamischer Belastung abstützen

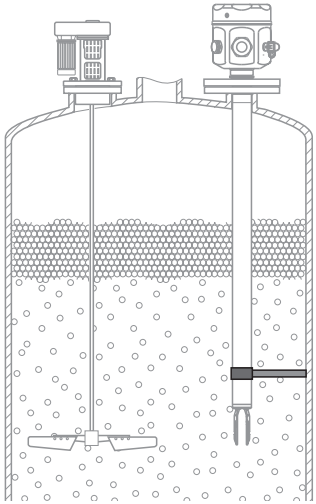
en – In cases of dynamic forces support

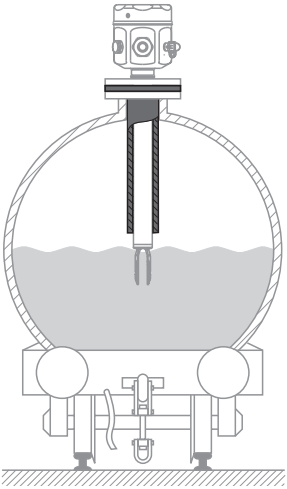
fr – En cas de contraintes dynamiques, étayer le tube

es – En caso de cargas dinámicas altas debe ser apoyado

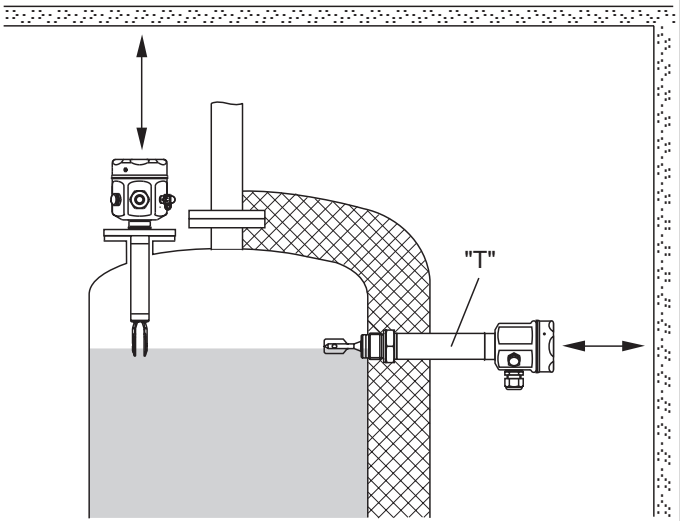
it – In caso di carichi dinamici, rinforzare con un supporto meccanico

nl – Bij mechanische belasting verstevigen





"T" = mit Temperaturdistanzstück für isolierten Tank
"T" = with temperature spacer for insulated tanks
"T" = avec élément de refroidissement pour réservoir isolé
"T" = con tramo disipador de temperatura para tanques aislados
"T" = con distanziale di temperatura per serbatoi isolati
"T" = met temperatuurreductiestuk voor geïsoleerde tanks



de – Freiraum vorsehen
en – Allow clearance
fr – Prévoir un espace libre
es – Prever espacio
it – Lasciare spazio per estrazione
nl – Ruimte vrijhouden

de – Schwinggabel ausrichten:
Markierung oben oder unten

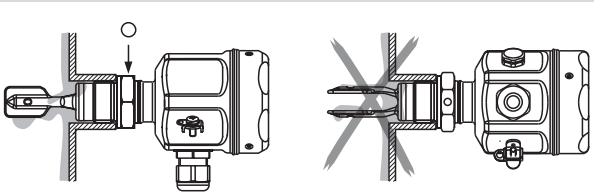
en – Orientation of fork tines:
Marking above or below

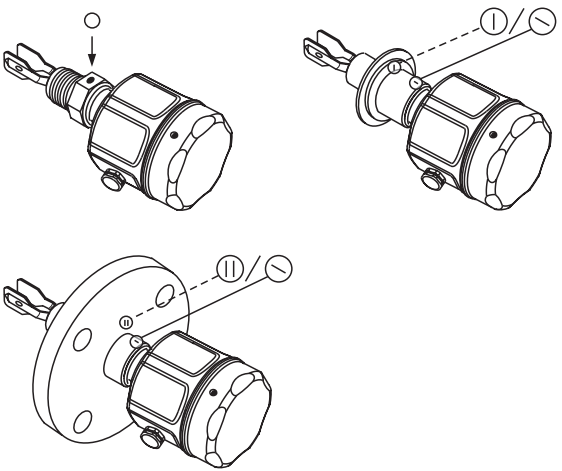
fr – Orientation des lames vibrantes:
Repères en haut ou en bas

es – Orientación de la horquilla:
Marca arriba o abajo

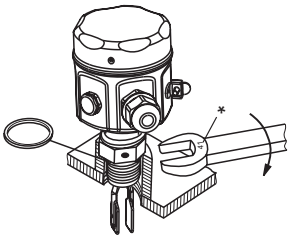
it – Allineamento della forcella:
Marcatura in alto o in basso

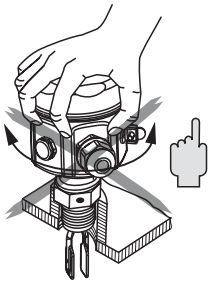
nl – Vork uitrichten:
Markering boven of onder



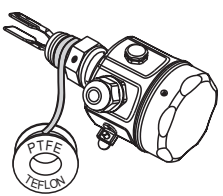


G ¾, 32 mm (1¼")*
G 1, 41 mm (1⅝")*

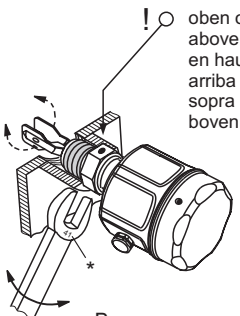




NPT ¾, R ¾, G ¾, 32 mm (1¼")*
NPT 1, R 1, G 1, 41 mm (1⅝")*



A



B

de – Liquiphant einschrauben.
Nicht am Gehäuse drehen.

en – Screw Liquiphant into process connection.
Don't use housing to turn.

fr – Visser le Liquiphant.
Ne pas se servir du boîtier.

es – Roscar el Liquiphant a la conexión a proceso.
No girar el cabezal.

it – Avvitare il Liquiphant all'attacco di processo.
Allo scopo **non** utilizzare la custodia.

nl – Schroef de Liquiphant in de procesaansluiting.
Draai hierbij **niet** aan de behuizing.

de – Ausrichten in Rohrleitungen:
Markierung in Fließrichtung

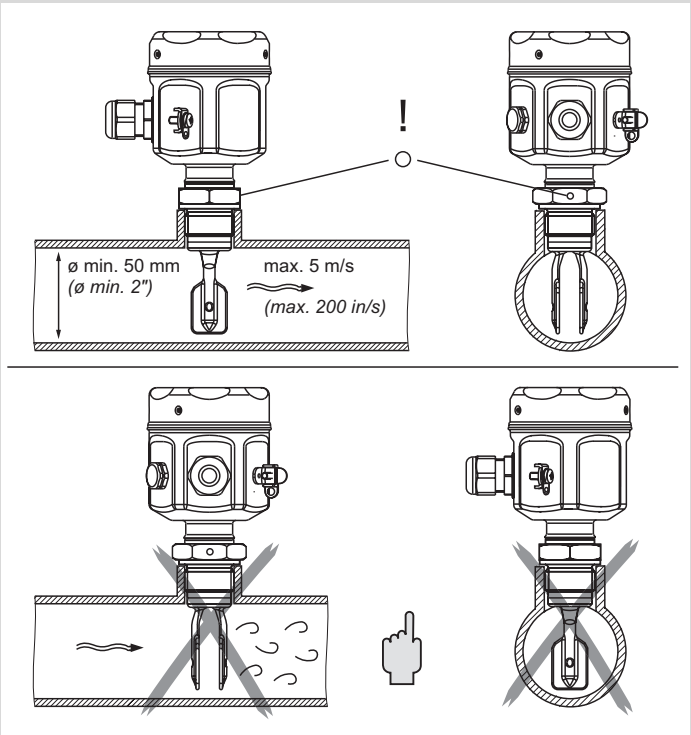
en – Orientation in pipes:
Marking in direction of flow

fr – Orientation dans une conduite:
Repère dans le sens de
l'écoulement

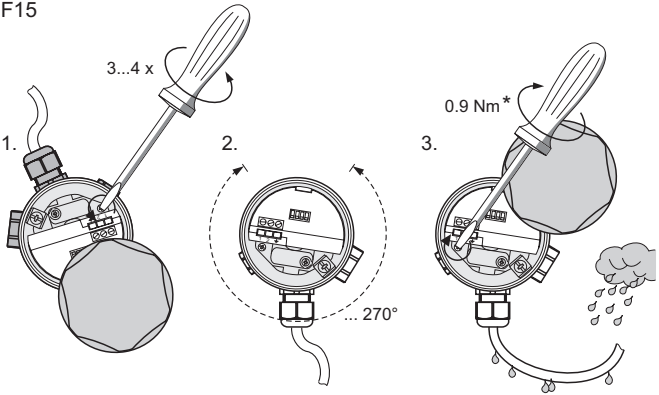
es – Montaje y orientación dentro
de tuberías:
Marca en dirección del caudal

it – Allineamento per montaggio
in tubazioni:
Marcatura nella direzione
del flusso

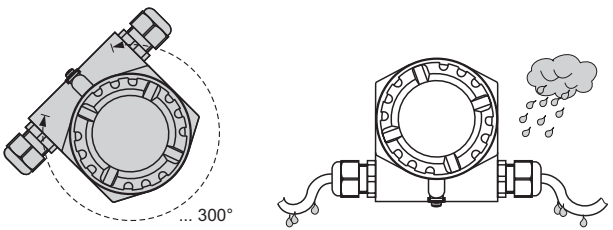
nl – Opstelling in leidingen:
Markering in de stroomrichting



F15



F16, F13, F17



de – Kabeleinführung ausrichten
en – Cable gland orientation
fr – Positionnement de l'entrée de câble
es – Ajuste del prensaestopa
it – Posizionamento del passacavo
nl – Kabelinvoer uitrichten

* Anzugsdrehmoment /
Torque /
Couple de serrage /
Esfuerzo de torsión /
Coppia di torsione /
Aandraaimoment

de - Einstellungen
Minimum-/Maximum-Sicherheitsschaltung

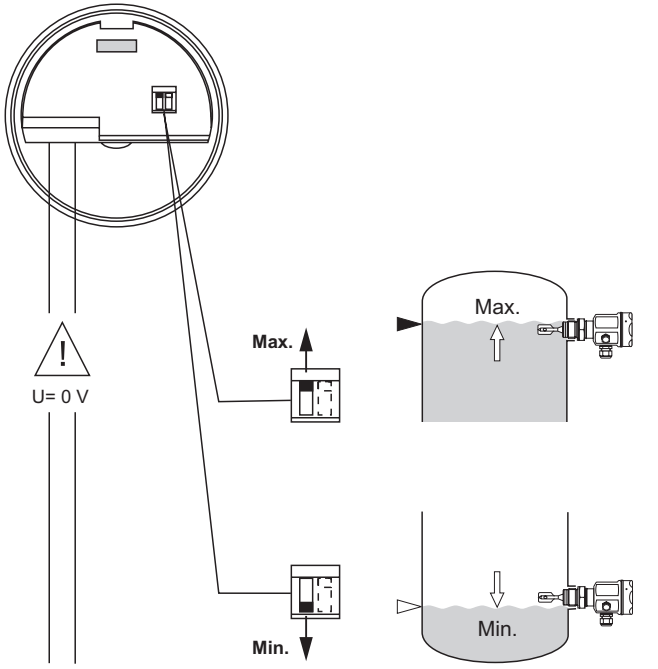
en - Setting-up
Minimum/maximum fail-safe mode

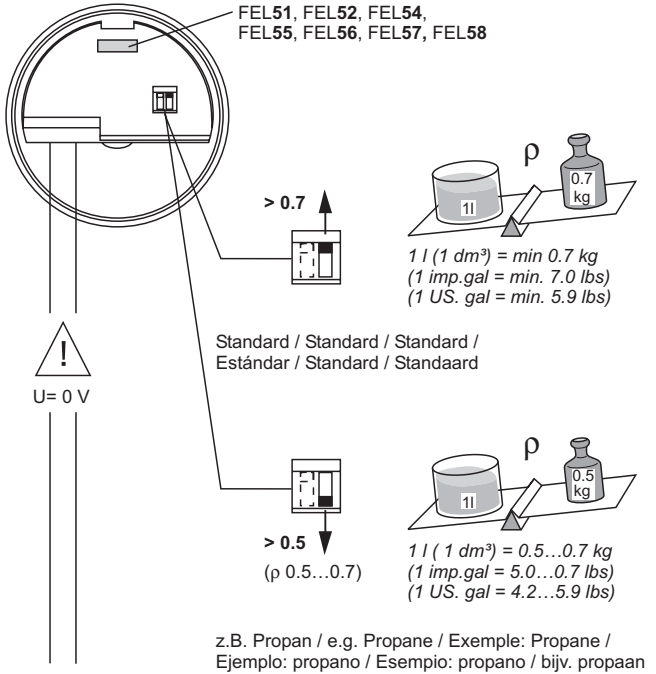
fr - Réglage
Sécurité minimum/maximum

es - Ajuste
Conmutador de seguridad mín./máx.

it - Messa in servizio
Selezione della modalità di sicurezza min./max.

nl - Instellingen
Minimum/maximum veiligheidsschakeling





de – Dichte der Flüssigkeit.
Dichte ρ gemessen in g/cm³ oder in kg/l.

en – Liquid density.
Density ρ measured in g/cm³ or in kg/l.

fr – Densité du liquide.
Unité de mesure de la densité ρ : g/cm³ ou kg/l.

es – Densidad de líquidos.
Densidad ρ medida en g/cm³ o en kg/l.

it – Densità del liquido.
Densità ρ misurata in g/cm³ o in kg/l.

nl – Dichtheid van de vloeistof.
Dichtheid ρ gemeten in g/cm³ of in kg/l.

de – Selbsttest FEL57
(Funktion siehe Seite 46, 47 und Schaltgerät)

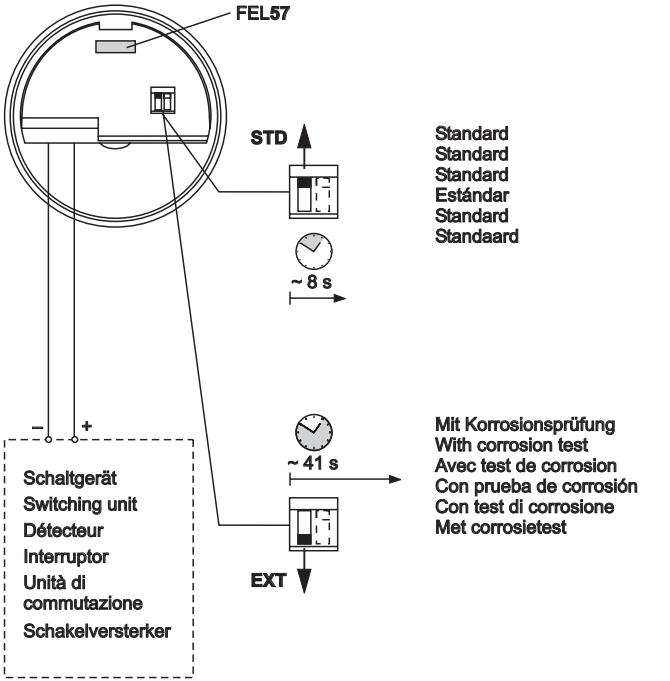
en – Selftest FEL57
(see page 46, 47 and switching unit for sequence)

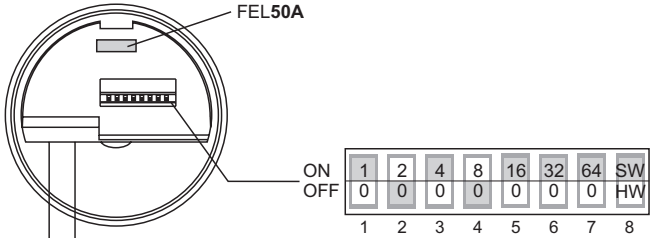
fr – Auto-test FEL57
(voir pages 46, 47 et détecteur)

es – Prueba automática FEL57
(ver pág. 46, 47 e interruptor para secuencia)

it – Prova automatica FEL57
(vds. pag. 46, 47 e unità di commutazione)

nl – Functietest FEL57
(zie voor functie pag 46, 47 en schakelversterker)





Beispiel / Example / Exemple / Ejemplo / Esempio / Bijv. :

2 + 8 = 10 = Adresse
Address
Adresse
Dirección
Indirizzo
Adres

Segmentkoppler
Segment coupler
Coupleur de segments
Acoplador segmento
Segment coupler
Segment koppeling

z.B. SPS / e. g. PLC /
p. e. API / por ej. PLC /
p. e. PLC / bijv. PLC /

de – Geräteadresse einstellen
(Einstellung der Parameter siehe BA141F)

en – Setting Device Address
(Setting the parameters, see BA141F)

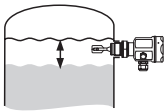
fr – Réglage de l'adresse d'appareil
(Réglage des paramètres voir BA141F)

es – Configuración de la dirección del equipo
(Ver configuración parámetros en BA141F)

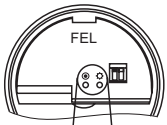
it – Impostare indirizzo del dispositivo
(Per impostazione parametri vds. BA141F)

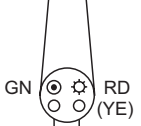
nl – Instrumentadres instellen
(Parameter instelling zie BA141F)

de - Lichtsignale
en - Light signals
fr - Signaux lumineux
es - Señales luminosas
it - Segnali luminosi
nl - Lichtsignalen



Füllstand variieren
Vary level
Varier le niveau
Nivel variable
Variare livello
Niveau variëren





Leuchtdioden / LEDs / DEL / LEDs / LED / LED's

Betrieb / Stand-by / Fonctionnement /
Reposo / Attesa / stand-by

Schaltzustand / Switching status / Etat de commutation /
Estado conexión / Stato di commutazione / schakelstand

FEL57, FEL50A: Bedeckung / Covering / Recouvrement /
Cubierto / Copertura / bedekking

leuchtet / on / allumée / iluminado / on / aan

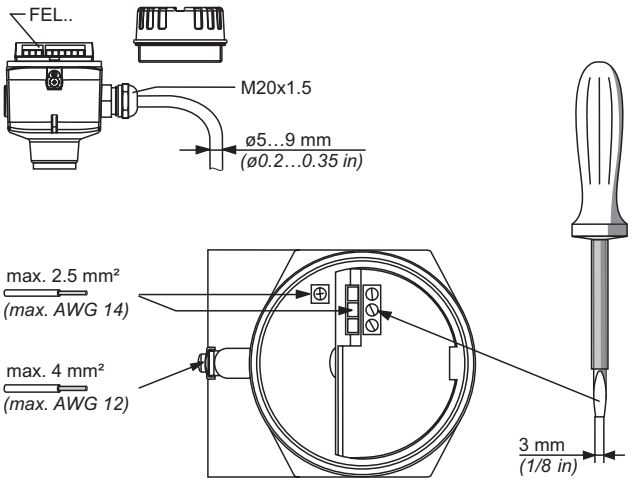
blinkt / flashes / clignote / parpadea / lampeggia / knippert

aus / off / éteinte / apagado / off / uit

Ausgangssignal / Output signal / Signal de sortie /
Señal de salida / Segnale uscita / uitgangssignaal

Störung / Fault / Défaut / Fallo / Guasto / storing

Nationale Normen und Vorschriften beachten!
Note national regulations!
Respecter les lois et règles locales en vigueur!
Considere reglamentaciones nacionales
Osservare le norme nazionali!
Nationale voorschriften in acht nemen!



de - Anschluss
en - Connections
fr - Raccordement
es - Conexiones
it - Collegamenti elettrici
nl - Aansluiting

de – Anschluss FEL51
Zweileiter-
Wechselstromanschluss

en – Connections FEL51
Two-wire AC connection

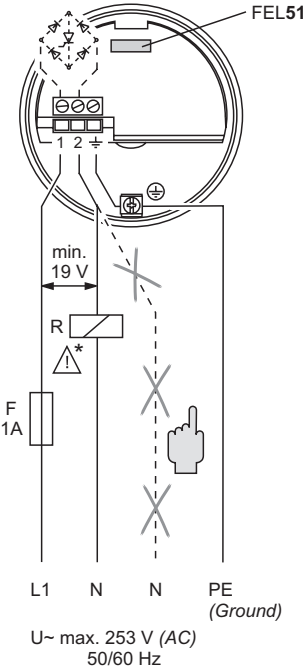
fr – Raccordement FEL51
Raccordement 2 fils
courant alternatif

es – Conexiones FEL51
Conexión a corriente alterna
a dos hilos

it – Collegamenti elettrici FEL51
Collegamento bifilare
con corrente alternata

nl – Aansluiting FEL51
2- draads
wisselspanningsaansluiting

Zerstörung
Destruction
Destruction
Destrucción
Distruzione
Storing



* Externe Last R **muss** angeschlossen werden

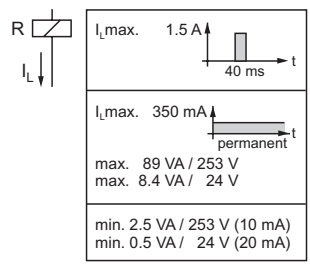
External load R **must** be connected

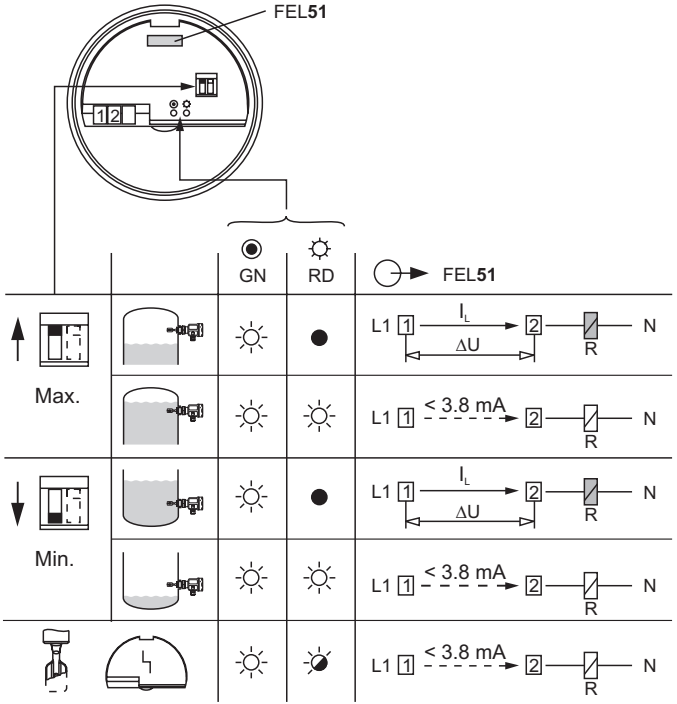
Charge externe R **doit** être raccordée

La carga externa R **debe** estar conectada

Il carico esterno R **deve** essere connesso

Externe belasting R **moet** aangesloten worden





de – Funktion FEL51
en – Function FEL51
fr – Fonction FEL51
es – Funcionamiento FEL51
it – Funzione FEL51
nl – Functie FEL51

ΔU_{FEL51} max. 12 V

de – Anschluss FEL52
Gleichstromanschluss (PNP)

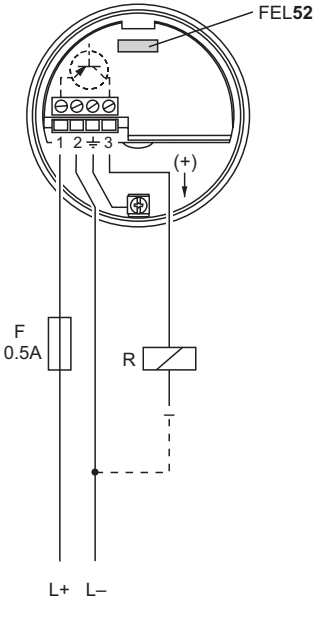
en – Connections FEL52
DC connection (PNP)

fr – Raccordement FEL52
Courant continu (PNP)

es – Conexiones FEL52
Alimentación CC (PNP)

it – Collegamenti elettrici FEL52
Collegamento CC (PNP)

nl – Aansluiting FEL52
Gelijkspanningsaansluiting (PNP)

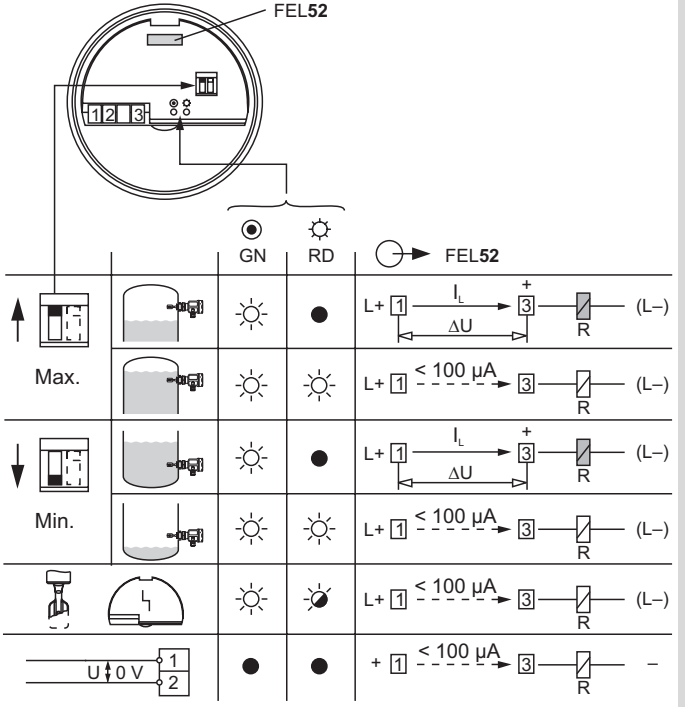


auch für DI-Module
also for DI modules
également pour des modules DI
también para módulos DI
anche per DI modules
aan de DI-module

EN 61131-2

R = externe Last
external load
charge externe
carga exterior
carico esterno
externe belasting

Imax. 350 mA
Umax. 55 V



de – Funktion FEL52
en – Function FEL52
fr – Fonction FEL52
es – Funcionamiento FEL52
it – Funzione FEL52
nl – Functie FEL52

ΔU_{FEL52} max. 3 V

de – Anschluss FEL54
Allstromanschluss
Relaisausgang

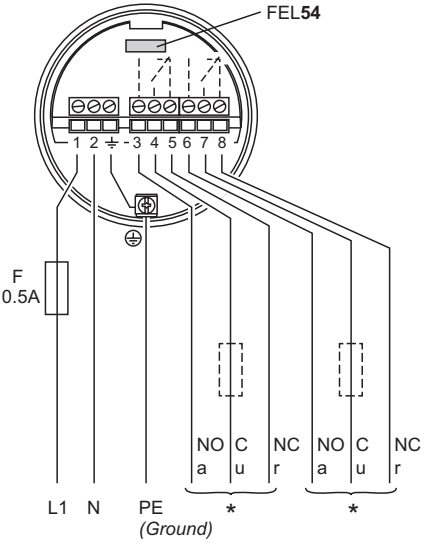
en – Connections FEL54
Universal connection
Relay output

fr – Raccordement FEL54
Tous courants
Sorties relais

es – Conexiones FEL54
Conexión universal
Salida por relé

it – Collegamenti elettrici FEL54
Collegamento corrente universale
Uscita relè

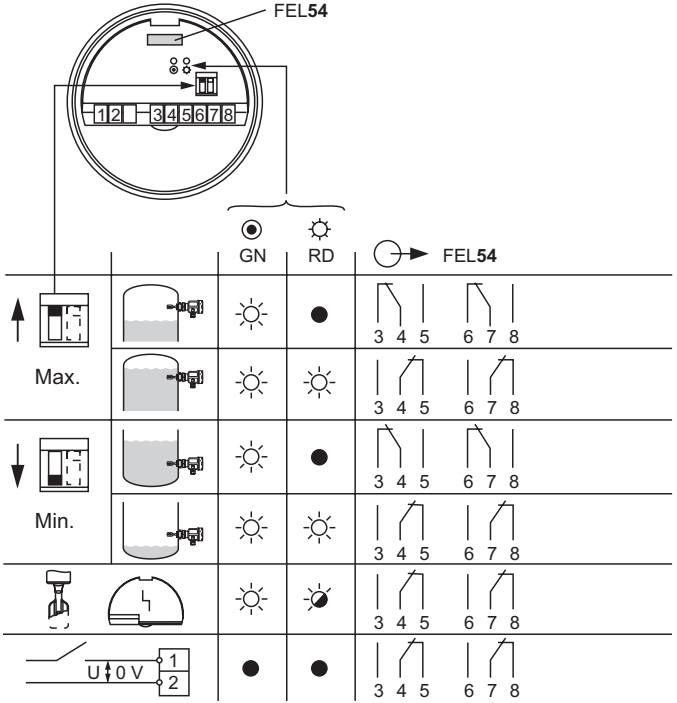
nl – Aansluiting FEL54
Universele spanningsaansluiting
Relaisuitgang



U~ 19…253 V *(AC)*

L+ L–
U⎓ 19… 55 V *(DC)*

* U~ max. 253 V, I~ max. 6 A
P~ max. 1500 VA, cos φ = 1
P~ max. 750 VA, cos φ > 0.7
I⎓ max. 6 A, U⎓ < 30 V
I⎓ max. 0.2 A, U⎓ < 125 V



de – Funktion FEL54
en – Function FEL54
fr – Fonction FEL54
es – Funcionamiento FEL54
it – Funzione FEL54
nl – Functie FEL54

de – Anschluss FEL55
Ausgang
8/16 mA

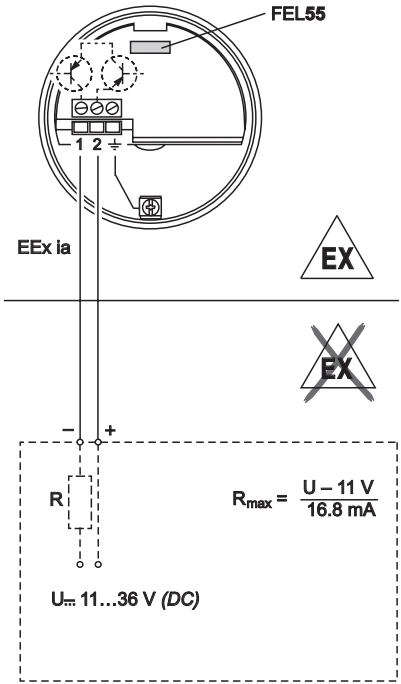
en – Connections FEL55
Output
8/16 mA

fr – Raccordement FEL55
Sortie
8/16 mA

es – Conexiones FEL55
Salida
8/16 mA

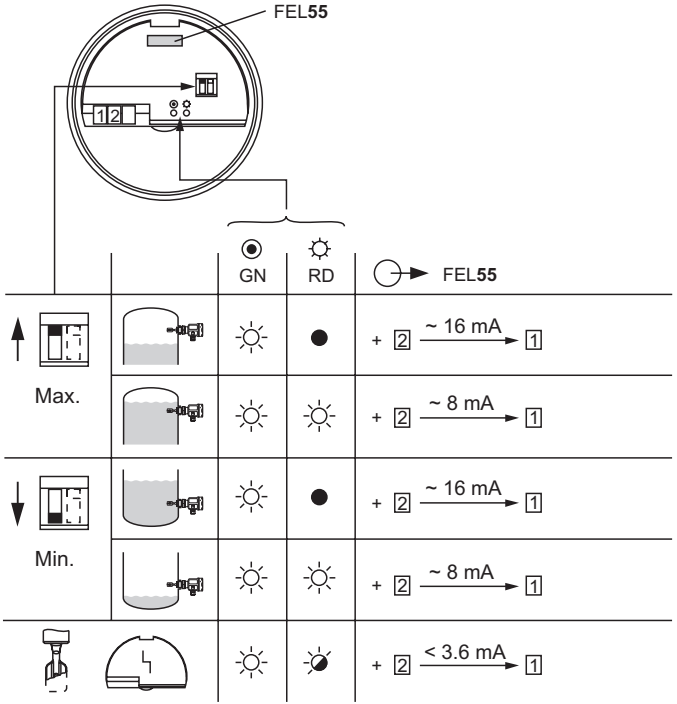
it – Collegamenti elettrici FEL55
Uscita
8/16 mA

nl – Aansluiting FEL55
Uitgang
8/16 mA



z.B. SPS, AI-Module
e. g. PLC, AI modules
p. e. API, modules AI
por ej. PLC, módulos AI
p. e. PLC, AI modules
bijv. PLC, AI-module

4...20 mA
EN 61131-2



de – Funktion FEL55
en – Function FEL55
fr – Fonction FEL55
es – Funcionamiento FEL55
it – Funzione FEL55
nl – Functie FEL55

de – Anschluss FEL56
NAMUR- Ausgang L-H
< 1,0 mA / > 2,2 mA

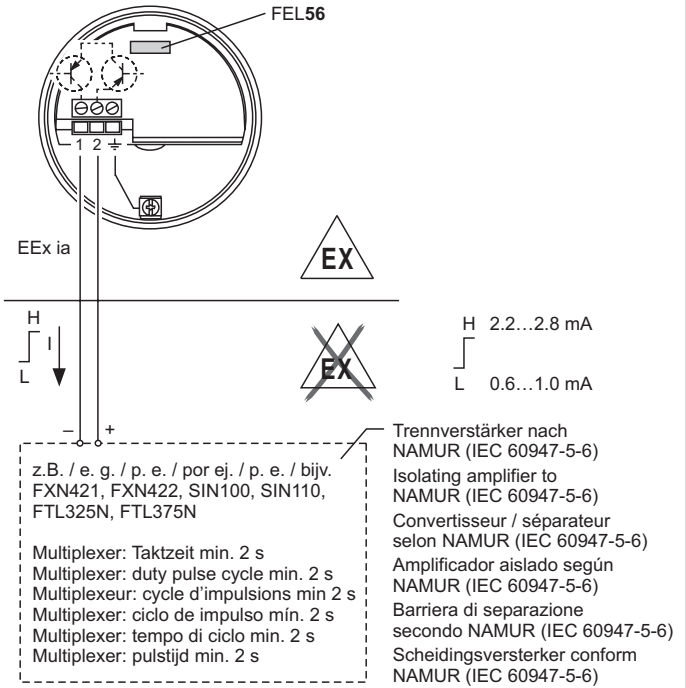
en – Connections FEL56
NAMUR output L-H
< 1,0 mA / > 2,2 mA

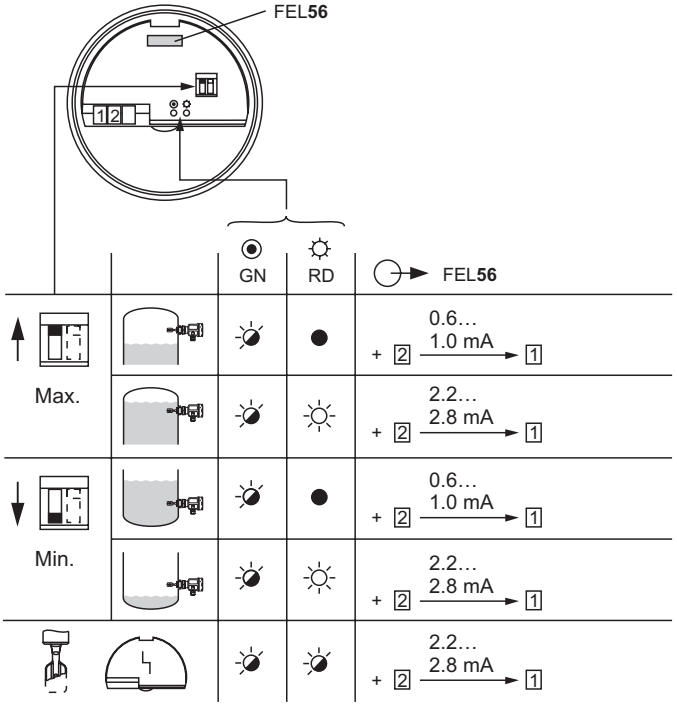
fr – Raccordement FEL56
Sortie NAMUR L-H
< 1,0 mA / > 2,2 mA

es – Conexiones FEL56
Salida NAMUR L-H
< 1,0 mA / > 2,2 mA

it – Collegamenti elettrici FEL56
NAMUR uscita L-H
< 1,0 mA / > 2,2 mA

nl – Aansluiting FEL56
NAMUR uitgang L-H
< 1,0 mA / > 2,2 mA


FEL56
1 2
EEx ia
EX
EX
H
I
L
H 2.2…2.8 mA
L 0.6…1.0 mA
– +
z.B. / e. g. / p. e. / por ej. / p. e. / bijv.
FXN421, FXN422, SIN100, SIN110,
FTL325N, FTL375N
Multiplexer: Taktzeit min. 2 s
Multiplexer: duty pulse cycle min. 2 s
Multiplexeur: cycle d'impulsions min 2 s
Multiplexer: ciclo de impulso mín. 2 s
Multiplexer: tempo di ciclo min. 2 s
Multiplexer: pulstijd min. 2 s
Trennverstärker nach NAMUR (IEC 60947-5-6)
Isolating amplifier to NAMUR (IEC 60947-5-6)
Convertisseur / séparateur selon NAMUR (IEC 60947-5-6)
Amplificador aislado según NAMUR (IEC 60947-5-6)
Barriera di separazione secondo NAMUR (IEC 60947-5-6)
Scheidingsversterker conform NAMUR (IEC 60947-5-6)



de – Funktion FEL56
en – Function FEL56
fr – Fonction FEL56
es – Funcionamiento FEL56
it – Funzione FEL56
nl – Functie FEL56

de – Anschluss FEL57
Ausgang PFM
150 Hz / 50 Hz

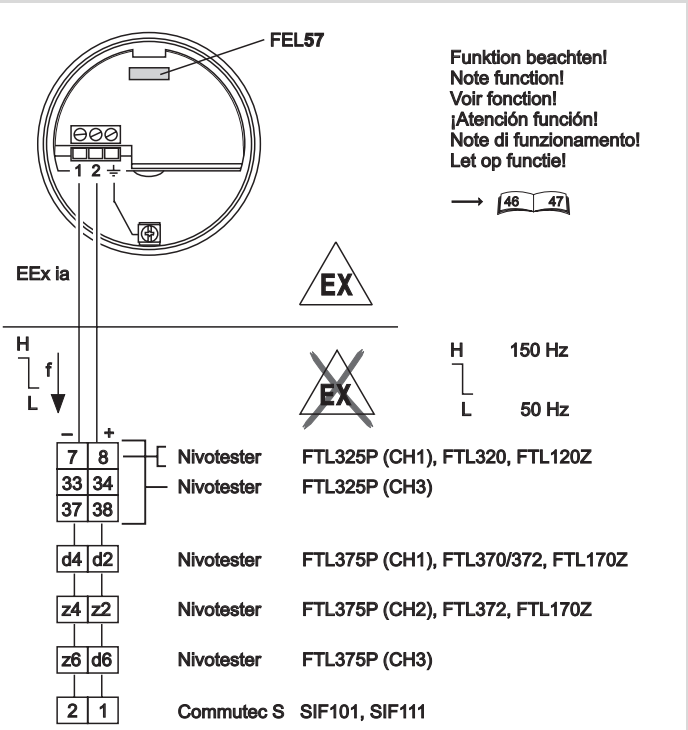
en – ConnectionsFEL 57
PFM output
150 Hz / 50 Hz

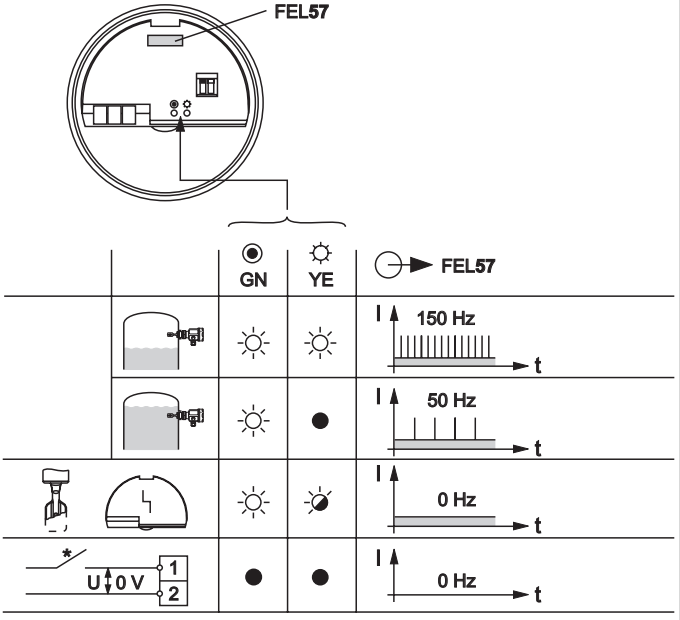
fr – Raccordement FEL57
Sortie PFM
150 Hz / 50 Hz

es – Conexiones FEL57
Salida PFM
150 Hz / 50 Hz

it – Collegamenti elettrici FEL57
PFM uscita
150 Hz / 50 Hz

nl – Aansluiting FEL57
PFM uitgang
150 Hz / 50 Hz





* Einschaltverhalten / Switch-on behaviour / Comportement à la mise sous tension / Comportamiento del cambio de estado / Comportamento accensione / Inschakelgedrag

→ 46 47

de – Funktion FEL57
en – Function FEL57
fr – Fonction FEL57
es – Funcionamiento FEL57
it – Funzione FEL57
nl – Functie FEL57

de – Einschaltverhalten
Selbsttest (STD)

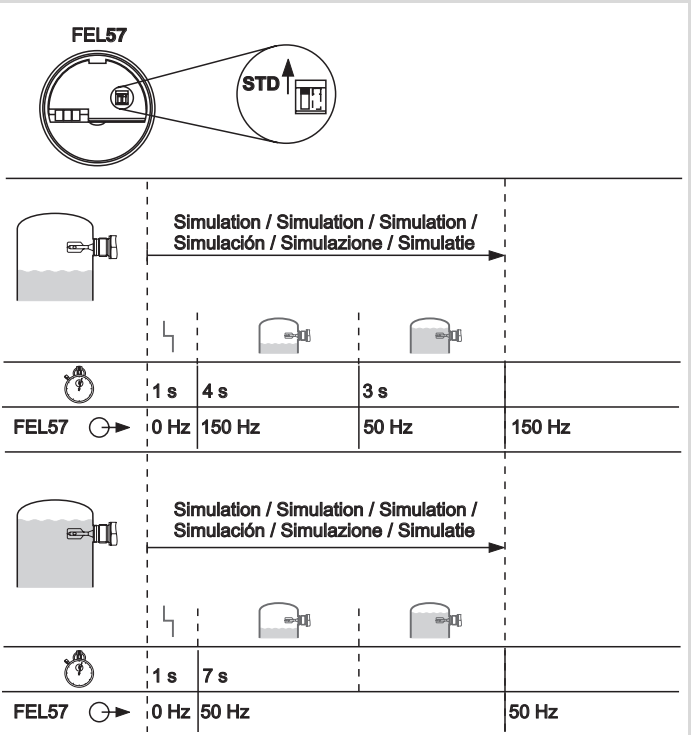
en – Switch-on behaviour
Selftest (STD)

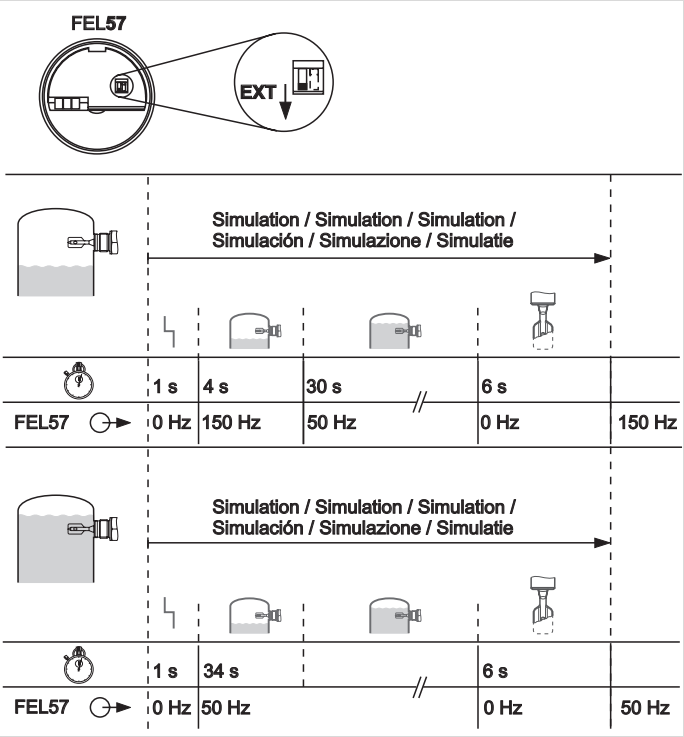
fr – Comportement à la mise sous tension
Auto-test (STD)

es – Comportamiento del cambio de e stado
Prueba automática (STD)

it – Comportamento in fase di accensione
Prova automatica (STD)

nl – Inschakelgedrag
Functietest (STD)





de – Einschaltverhalten
Selbsttest (EXT)

en – Switch-on behaviour
Selftest (EXT)

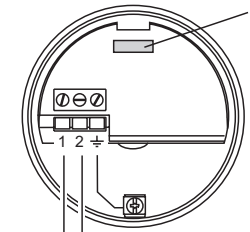
fr – Comportement à la mise sous tension
Auto-test (EXT)

es – Comportamiento del cambio de e stado
Prueba automática (EXT)

it – Comportamento in fase di accensione
Prova automatica (EXT)

nl – Inschakelgedrag
Functietest (EXT)

de – Anschluss FEL50A
en – Connections FEL50A
fr – Raccordement FEL50A
es – Conexiones FEL50A
it – Collegamenti elettrici FEL50A
nl – Aansluiting FEL50A

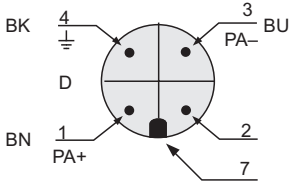


PA– PA+
U⎓ 9...32 V *(DC)*

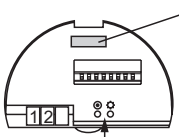
Segmentkoppler
Segment coupler
Coupleur de segments
Acoplador segmento
Segment coupler
Segment koppeling

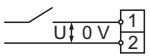
z.B. SPS / e. g. PLC
p. e. API / por ej. PLC
p. e. PLC / bijv. PLC

M12-Stecker / M12 Plug /
Connecteur M12 / M12 Conector /
Connettore M12 / M12 Connector



Gerätestecker am Gehäuse (male)
Device plug on housing (male)
Connecteur d'appareil sur le boîtier (mâle)
Conector del equipo en cabezal (macho)
Connettore del dispositivo (maschio)
Instrumentsteker op behuizing (male)



		GN	YE	FEL50A PA-Bussignal / PA Bus Signal / Signal bus PA / Señal Bus PA / Segnale bus PA / PA bussignaal
nicht invertiert not inverted non inversé no invertido non invertito niet geïnverteerd		☼	●	OUT_D = 0
		☼	☼	OUT_D = 1
invertiert inverted inversé invertido invertito geïnverteerd		☼	☼	OUT_D = 0
		☼	●	OUT_D = 1
SPS Commuwin II		☼	–	Kommunikation/ Communication/ Communication / Comunicación / Comunicazione / Communicatie
		–	☼	Status siehe BA141F Status, see BA141F Etat, voir BA141F Estado, ver BA141F Stato, vedere BA141F Status, zie BA141F
		●	●	../..

de – Funktion FEL50A
en – Function FEL50A
fr – Fonction FEL50A
es – Funcionamiento FEL50A
it – Funzione FEL50A
nl – Functie FEL50A

de – Anschluss FEL58
NAMUR- Ausgang H-L
> 2,2 mA / < 1,0 mA

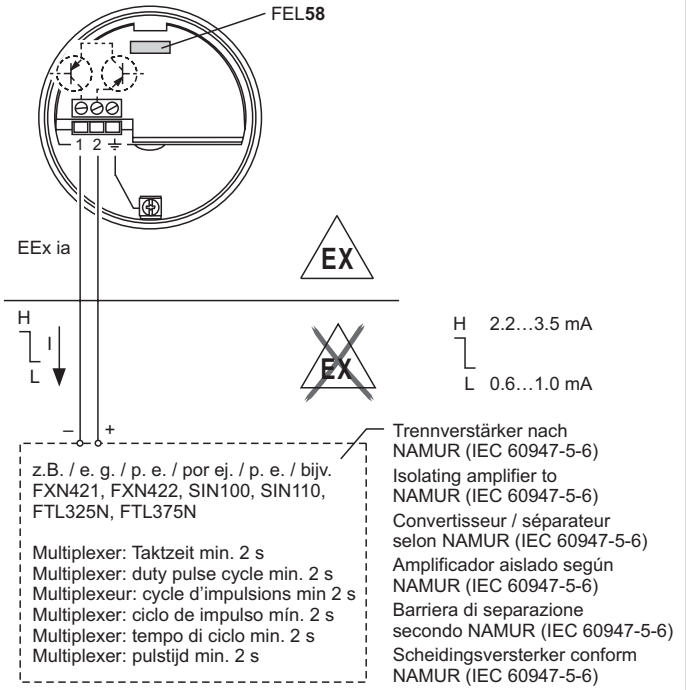
en – Connections FEL58
NAMUR output H-L
> 2,2 mA / < 1,0 mA

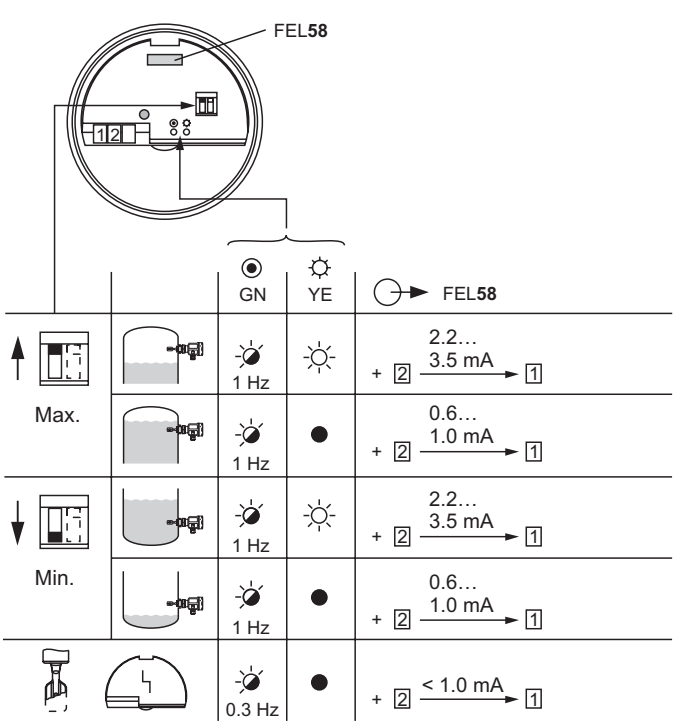
fr – Raccordement FEL58
Sortie NAMUR H-L
> 2,2 mA / < 1,0 mA

es – Conexiones FEL58
Salida NAMUR H-L
> 2,2 mA / < 1,0 mA

it – Collegamenti elettrici FEL58
NAMUR uscita H-L
> 2,2 mA / < 1,0 mA

nl – Aansluiting FEL58
NAMUR uitgang H-L
> 2,2 mA / < 1,0 mA


FEL58
1 2
EEx ia
EX
EX
H
I
L
H 2.2…3.5 mA
L 0.6…1.0 mA
– +
z.B. / e. g. / p. e. / por ej. / p. e. / bijv.
FXN421, FXN422, SIN100, SIN110,
FTL325N, FTL375N
Multiplexer: Taktzeit min. 2 s
Multiplexer: duty pulse cycle min. 2 s
Multiplexeur: cycle d'impulsions min 2 s
Multiplexer: ciclo de impulso mín. 2 s
Multiplexer: tempo di ciclo min. 2 s
Multiplexer: pulstijd min. 2 s
Trennverstärker nach NAMUR (IEC 60947-5-6)
Isolating amplifier to NAMUR (IEC 60947-5-6)
Convertisseur / séparateur selon NAMUR (IEC 60947-5-6)
Amplificador aislado según NAMUR (IEC 60947-5-6)
Barriera di separazione secondo NAMUR (IEC 60947-5-6)
Scheidingsversterker conform NAMUR (IEC 60947-5-6)



de – Funktion FEL58
en – Function FEL58
fr – Fonction FEL58
es – Funcionamiento FEL58
it – Funzione FEL58
nl – Functie FEL58

de – Funktion Prüftaste FEL58
Sicherheitsschaltung MAX

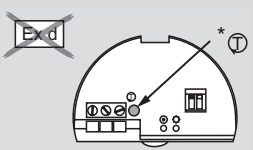
en – Function test button FEL58
Fail-safe mode MAX

fr – Fonction touche test FEL58
Sécurité MAX

es – Funcionamiento
botón de prueba FEL58
Conmutador de seguridad MAX

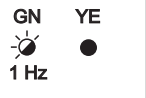
it – Funzione pulsante test FEL58
Selezione della modalità di
sicurezza MAX

nl – Functie testknop FEL58
Veiligheidsschakeling MAX

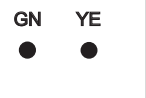


MAX +

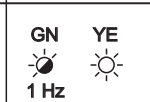
1. **Normaler Betrieb /
Normal operation /
Fonctionnement normal /
Funcionamiento normal /
Funzionamento normale /
Normaal bedrijf**

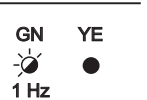


2. **Prüftaste drücken /
Press test button /
Appuyer sur la touche test /
Pulse el botón de prueba /
Premere il pulsante test /
Testknop indrukken**



3. **Prüftaste loslassen,
nach ~2 s normaler Betrieb /
Release the test button,
after ~2 s normal operation /
Relâcher la touche test,
après ~2 s fonctionnement normal /
Deje de presionar el botón de prueba,
después de ~2 s funcionamiento normal /
Rilasciare il pulsante test,
dopo ~2 s funzionamento normale /
De testknop loslaten,
na ~2 s normaal bedrijf**





MIN + T		
1. Normaler Betrieb / Normal operation / Fonctionnement normal / Funcionamiento normal / Funzionamento normale / Normaal bedrijf	GN YE 1 Hz + 2 2.2… 3.5 mA 1	GN YE 1 Hz + 2 0.6… 1.0 mA 1
2. Prüftaste drücken / Press test button / Appuyer sur la touche test / Pulse el botón de prueba / Premere il pulsante test / Testknop indrukken >3 s	GN YE + 2 0 mA 1	GN YE + 2 0 mA 1
3. Prüftaste loslassen, nach ~2 s normaler Betrieb / Release the test button, after ~2 s normal operation / Relâcher la touche test, après ~2 s fonctionnement normal / Deje de presionar el botón de prueba, después de ~2 s funcionamiento normal / Rilasciare il pulsante test, dopo ~2 s funzionamento normale / De testknop loslaten, na ~2 s normaal bedrijf	GN YE 1 Hz + 2 2.2… 3.5 mA 1	GN YE 1 Hz + 2 0.6… 1.0 mA 1

de - Funktion Prüftaste FEL58
Sicherheitsschaltung MIN

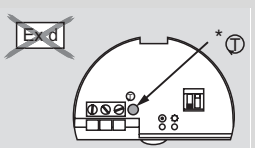
en - Function test button FEL58
Fail-safe mode MIN

fr - Fonction touche test FEL58
Sécurité MIN

es - Funcionamiento
botón de prueba FEL58
Conmutador de seguridad MIN

it - Funzione pulsante test FEL58
Selezione della modalità di
sicurezza MIN

nl - Functie testknop FEL58
Veiligheidsschakeling MIN



de - Wartung, Reinigung
Anbackungen entfernen

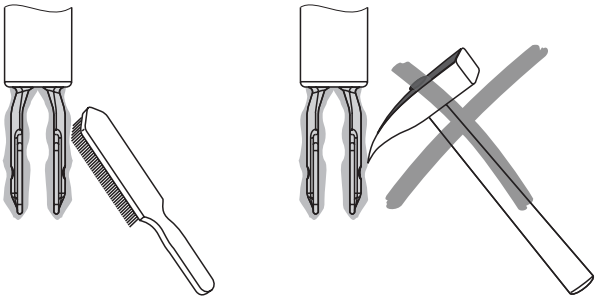
en - Maintenance, Cleaning
Removal of encrustation

fr - Entretien, Nettoyage
Enlever les incrustations

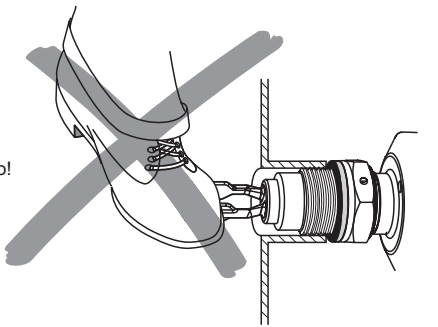
es - Mantenimiento, Limpieza
Eliminación de adherencias

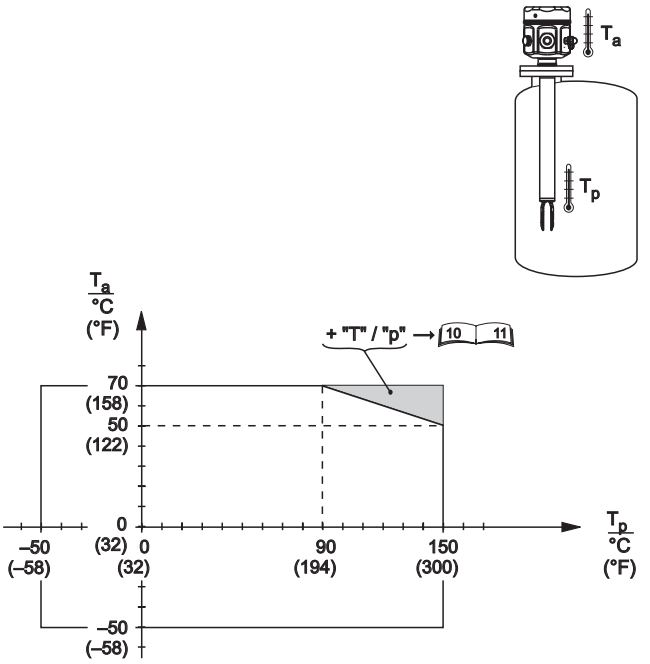
it - Manutenzione, Pulizia
Rimozione dei depositi

nl - Onderhoud, Reiniging
Aangroei verwijderen



Nicht besteigen!
Don't use as a step!
Ne pas marcher
sur les lames vibrantes!
No usar como peldaño!
Non usare come scalino!
Niet op staan!





de - Technische Daten
Umgebungstemperatur T_a
Prozesstemperatur T_p

en - Technical Data
Ambient temperature T_a
Process temperature T_p

fr - Caractéristiques techniques
Température ambiante T_a
Température de process T_p

es - Datos técnicos
Temperatura ambiente T_a
Temperatura del proceso T_p

it - Dati tecnici
Temperatura ambiente T_a
Temperatura di processo T_p

nl - Technische gegevens
Omgevingstemperatuur T_a
Procestemperatuur T_p

de – Prozessdruck p_e
Prozesstemperatur T_p

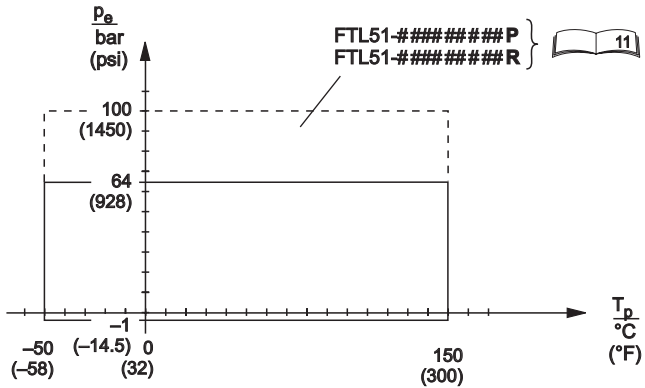
en – Process pressure p_e
Process temperature T_p

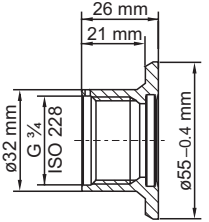
fr – Pression de process p_e
Température de process T_p

es – Presión del proceso p_e
Temperatura del proceso T_p

it – Pressione di processo p_e
Temperatura di processo T_p

nl – Procesdruk p_e
Procestemperatuur T_p

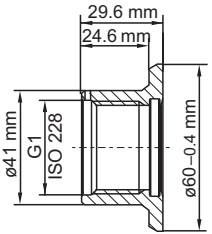




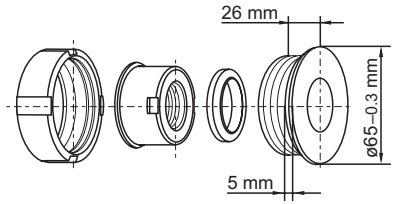
G ¾
52001052

max. 25 bar / 150 °C
(max 360 psi / 300 °F)

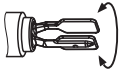
max. 40 bar / 100 °C
(max 580 psi / 210 °F)



G 1
52001051



G 1
52001221



de - Zubehör
Einschweißadapter

en - Accessories
Welding neck

fr - Accessoires
Adaptateur à souder

es - Accesorios
Adaptador para soldar

it - Accessori
Adattatore saldato

nl - Toebehoren
Inlasadapter

1.4435 *(AISI 316L)*

100 mm = 3. 94 in

de – Lose Flansche Gewinde G1;
Deckel mit Sichtscheibe

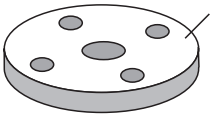
en – Lap joint flanges with
BSP 1 (G1) thread;
Covers with window

fr – Brides avec filetage G1;
Couvercles avec fenêtre

es – Bridas con resalte y
rosca BSP 1 (G1);
Cubierta con ventana

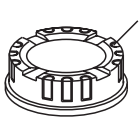
it – Flangia di connessione con
filetto BSP 1 (G1);
Coperchio con finestra

nl – Blindflens met G1 draadgat;
Deksel met venster



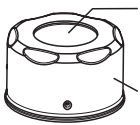
DN 50, PN 40, DIN 2527 B
918143-0000

2", 150 psi, RF, ANSI B 16.5
918144-0000



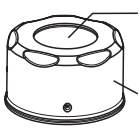
für PBT-Gehäuse / for PBT housing /
pour boîtier PBT / para caja PBT /
per custodia PBT / voor PBT behuizing

943461-0001



für Stahlgehäuse / for steel housing /
pour boîtier inox / para caja de acero /
per custodia in acciaio /
voor R. V. stalen behuizing

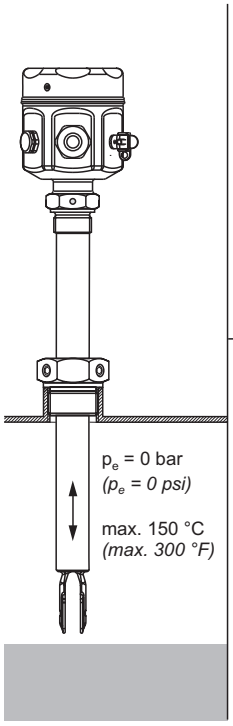
943301-1000

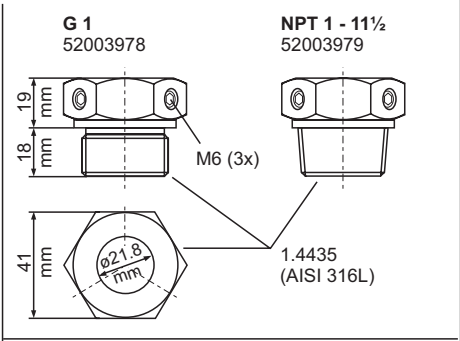


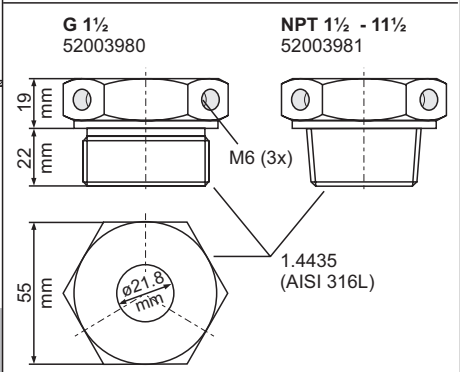
für Stahlgehäuse / for steel housing /
pour boîtier inox / para caja de acero /
per custodia in acciaio /
voor R. V. stalen behuizing

52001403

100 mm = 3. 94 in







de – Schiebemuffen
für drucklosen Betrieb

en – Sliding sleeves
for unpressurised operation

fr – Manchons coulissants
pour applications sans pression

es – Manguitos deslizantes
para operación sin presión

it – Manicotto scorrevole
per impieghi privi di pressione

nl – Schuifmof
voor drukloze toepassing

siehe / see / voir / ver / vedi / zie :
KA151F (G 1, NPT 1)
KA152F (G 1½, NPT 1½)

100 mm = 3. 94 in

de – Hochdruck-Schiebemuffen

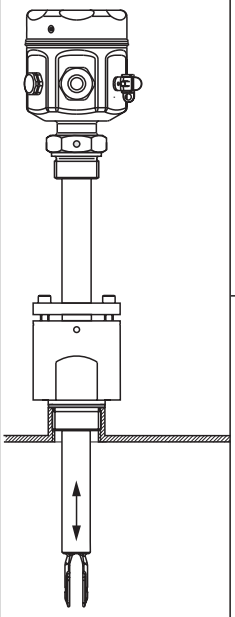
en – High pressure sliding sleeves

fr – Manchons coulissants haute pression

es – Manguitos deslizantes para alta presión

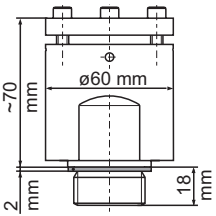
it – Manicotto scorrevole per impieghi ad alta pressione

nl – Schuifmof voor toepassing onder druk



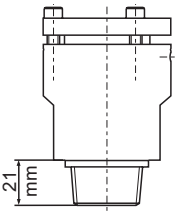
G 1
1.4435 (AISI 316L)
52003663

AlloyC4
52003664



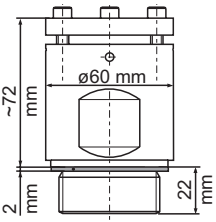
NPT 1 - 11½
1.4435 (AISI 316L)
52003667

AlloyC4
52003668



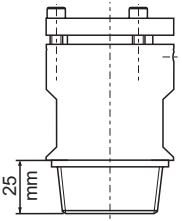
G 1½
1.4435 (AISI 316L)
52003665

AlloyC4
52003666



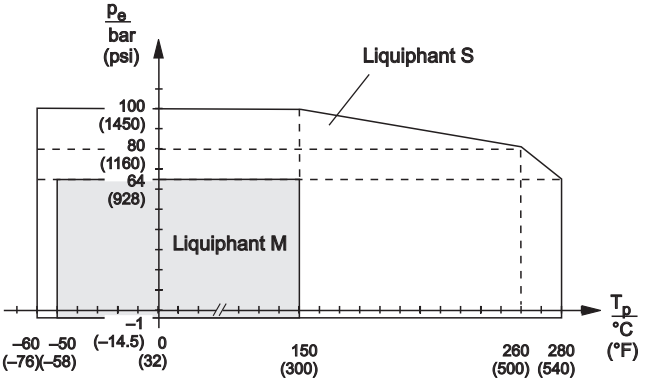
NPT 1½ - 11½
1.4435 (AISI 316L)
52003669

AlloyC4
52003670



siehe / see / voir / ver / vedi / zie :
KA153F (G 1, NPT 1)
KA154F (G 1½, NPT 1½)

100 mm = 3. 94 in



de – Hochdruck-Schiebemuffen:
Prozessdruck p_e
Prozesstemperatur T_p

en – High pressure sliding sleeves:
Process pressure p_e
Process temperature T_p

fr – Manchons coulissants haute pression:
Pression de process p_e
Température de process T_p

es – Manguitos deslizantes para alta presión:
Presión del proceso p_e
Temperatura del proceso T_p

it – Manicotto scorrevole per impieghi ad alta pressione:
Pressione di processo p_e
Temperatura di processo T_p

nl – Schuifmof voor toepassing onder druk:
Procesdruk p_e
Procestemperatuur T_p

Fehlfunktion	Ursache	Maßnahme
Schaltet nicht	Versorgungsspannung fehlt	Versorgung prüfen
	Signalleitung defekt	Signalleitung prüfen
	Elektronikeinsatz defekt – FEL51 direkt an L1 und N angeschlossen	Austauschen – FEL51 immer über externe Last anschließen
	Dichte der Flüssigkeit zu gering	Am Elektronikeinsatz Dichte auf > 0,5 einstellen
	Schwinggabel verkrustet	Schwinggabel säubern
	Schwinggabel korrodiert (Anzeige am FEL: rot/gelb blinkt, FEL58: grün blinkt 0,3 Hz)	Schwinggabel komplett mit Prozessanschluss austauschen
	FEL51: Relais mit zu großem Innenwiderstand angeschlossen	Geeignetes Relais anschließen
	FEL51: Relais mit zu geringem Haltestrom angeschlossen	Widerstand parallel zum Relais anschließen
	FEL54: Kontakte verschweißt (nach einem Kurzschluss)	FEL54 austauschen; Sicherung in den Kontaktstromkreis
Schaltet falsch	Minimum-/Maximum- Sicherheitsschaltung vertauscht	Am Elektronikeinsatz Sicherheitsschaltung richtig einstellen
Fehlschaltung, sporadisch	Dichter schwerer Schaum, wilde Turbulenzen, aufgeschäumte Flüssigkeit	Liquiphant im Bypass montieren
	Extreme Funkstörung	Verbindungskabel abschirmen
	Extreme Vibrationen	Entkoppeln, dämpfen, Schwinggabel 90° drehen
	Wasser im Gehäuse	Deckel und Kabeldurchführungen fest zuschrauben
	FEL52: Ausgang überlastet	Last, (Leitungs-) Kapazität verringern
Fehlschaltung nach Netzausfall	FEL57, Verhalten beim Einschalttest (wiederkehrende Prüfung)	Schaltverhalten FEL57 beachten; Anlagensteuerung nach Netzausfall bis ca. 45 s blockieren

Fault	Reason	Remedy
Does not switch	No power	Check power
	Faulty signal line	Check signal line
	Faulty electronic insert - FEL51 connected directly to L1 and N	Exchange - always connect FEL51 via external load
	Density of liquid too low	Set density to > 0.5 at electronic insert
	Fork encrusted	Clean fork
	Fork corroded (Indication on FEL: red/yellow flashes, FEL58: green flashes 0.3 Hz)	Exchange fork and process connection
	FEL51: Internal resistance of connected relay too large	Connect suitable relay
	FEL51: Holding current of connected relay too low	Connected resistor in parallel with relay
	FEL54: Contacts welded together (after short-circuit)	Exchange FEL54; put fuse in contact circuit
Switches incorrectly	Min-/Max- fail-safe mode set wrongly	Set correct mode at electronic insert
Sporadic faulty switching	Thick heavy foam, very turbulent conditions, foaming liquid	Mount Liquiphant in bypass
	Extreme RFI	Use screened cable
	Extreme vibration	Decouple, damp, turn fork 90°
	Water in housing	Screw cover and cable gland tight
	FEL52: Output overloaded	Reduce load,(cable) capacitance
Switches incorrectly after power failure	FEL57, behaviour during switch-on test (functional test)	Observe switching behaviour of FEL57; After power failure blockplant control for up to 45 s

fr - Recherche de défauts

Défaut	Cause	Mesure
Ne commute pas	Tension d'alimentation manquante	Vérifier la tension d'alimentation
	Câble de signal défectueux	Vérifier le câble de signal
	Electronique défectueuse – FEL51 relié directement á L1 et N	Remplacer – Relier FEL51 toujours via la charge externe
	Densité du liquide trop faible	Régler la densité sur > 0,5 sur l'électronique
	Lames vibrantes encroûtées	Nettoyer les lames vibrantes
	Lames vibrantes corrodées (Sur FEL: rouge/jaune clignote, FEL58: vert clignote 0,3 Hz)	Remplacer les lames vibrantes ainsi que le raccord process
	FEL51: relais avec résistance interne trop élevée	Raccorder un relais approprié
	FEL51: relais avec courant de maintien trop faible	Raccorder une résistance en parallèle au relais
	FEL54: contacts soudés (après un court-circuit)	Remplacer FEL54; fusible dans le circuit courant
Mauvaise commutation	Sécurité min/max inversée	Régler correctement le circuit de sécurité sur l'électronique
Mauvaise commutation, sporadique	Mousse dense et lourde, fortes turbulences, liquide émulsionné	Monter le Liquiphant en bypass
	Parasites puissants	Blinder le câble de liaison
	Vibrations importantes	Découpler, amortir, tourner la fourche de 90°
	Eau dans le boîtier	Visser fermement le couvercle et les entrées de câble
	FEL52: surcharge de la sortie	Réduire la charge et la capacité (de ligne)
Mauvaise commutation après coupure	FEL57, comportement lors du test de mise sous tension (test cyclique)	Observer le comportement du FEL57 à la mise sous tension; bloquer la commande de l'installation après coupure de courant pendant max. 45 s

Fallo	Causa	Solución
No conmuta	No hay alimentación	Comprobar alimentación
	Señal defectuosa	Comprobar cable de señal
	Electrónica defectuosa – FEL51 conectada directamente a L1 y N	Cambio – Siempre conectar FEL51 vía una carga externa
	Densidad del líquido demasiado baja	Fijar densidad a > 0.5 en la electrónica
	Horquillas con adherencias	Limpiar horquillas
	Horquillas corroidas (En FEL: rojo/amarillo parpadea, FEL58: verde parpadea 0.3 Hz)	Cambiar la horquilla y la conexión a proceso
	FEL51: Relé con resistencia interna demasiado grande	Conectar un relé adecuado
	FEL51: El relé conectado retiene muy poca corriente	Resistencia conectada en paralelo con el relé
	FEL54: Contactos soldados juntos (después del corto circuito)	Cambiar FEL54; poner fusible en el circuito de contacto
Conmuta incorrectamente	El modo de fallo mín./máx. está mal ajustado	Ajustar el modo correcto en la electrónica
Fallos de conmutación esporádicos	Espuma muy densa, turbulencias, líquidos espumosos	Montar el Liquiphant en bypass
	RFI extremo	Utilizar cable apantallado
	Vibraciones extremas	Desacoplar, amortiguar y girar las horquillas 90°
	Agua en el cabezal	Roscar la cubierta y el prensaestopas firmemente
	FEL52: Salida con sobretensión	Reducir carga, capacidad (cable)
Conmuta incorrectamente después de un fallo de alimentación	FEL57, comportamiento durante la comprobación de conmutación (test de funcionamiento)	Observar el comportamiento de conmutación del FEL57; del fallo de alimentación, bloqueo del control de la planta durante 45 s aprox.

it – Individuazione e eliminazione delle anomalie

Guasto	Motivo	Rimedio
Non commuta	Mancanza alimentazione	Controllare l'alimentazione
	Linea segnale guasta	Controllare segnale linea
	Inserto elettronico guasto – FEL51 connesso direttamente a L1 e N	Sostituire - connettere sempre FEL51 mediante carico esterno
	Densità del liquido troppo bassa	Impostare la densità a > 0,5 sull'inserto elettronico
	Forcella incrostata	Pulire la forcella
	Forcella corrosa (Sul FEL: rosso/giallo lampeggiano, FEL58: verde lampeggiano 0,3 Hz)	Sostituire la forcella e la connessione al processo
	FEL51: resistenza interna del relè connesso troppo grande	Collegare il relè adeguato
	FEL51: corrente di mantenimento del relè connesso troppo grande	Connettere resistenza in parallelo al relè
	FEL54: contatti saldati insieme (dopo il corto circuito)	Sostituire FEL54; mettere il fusibile nel circuito di contatto
Commuta non correttamente	Modalità di sicurezza min-/max-impostata in modo errato	Impostare la modalità corretta nell'inserto elettronico
Commutazione sporadicamente difettosa	Schiuma pesante e torbida condizioni molto turbolente, liquido che produce schiuma	Montare il Liquiphant nel bypass
	RFI forte	Usare cavo schermato
	Forte vibrazione	Disaccoppiare, smorzare, ruotare la forcella di 90°
	Acqua nella custodia	Avvitare correttamente il coperchio e il passacavi
	FEL52: Uscita sovraccaricata	Ridurre il carico, capacità (cavo)
Commutazione non corretta dopo la mancanza alimentazione	FEL57, comportamento durante la fase di test all'accensione (test di funzionamento)	Osservare il comportamento di commutazione del FEL57; dopo il ripristino di una mancanza di alimentazione inibire il controllo dell'impianto per 45 s

Fout	Oorzaak	Maatregel
Schakelt niet	Voeding ontbreekt	Voeding kontroleren
	Signaalleiding defect	Signalleiding kontroleren
	Insert defect - FEL51 direct op L1 en N aangesloten	Ver vangen - FEL51 altijd via een belasting aansluiten
	Dichtheid van de vloeistof te gering	Op elektronica- insert dichtheid op > 0, 5 instellen
	Trilvork te veel vervuild	Trilvork reinigen
	Trilvork gecorrodeerd (LED op FEL knippert rood/geel, FEL58: groen knippert 0,3 Hz)	Trilvork compleet met procesaansluiting vervangen
	FEL51: Relais met te groteinwendige weerstand aangesloten	Passender relais aansluiten
	FEL51: Relais met te geringe houdstroom aangesloten	Weerstand parallel aan relais aansluiten
	FEL54: Contacten verkleeft (na een kortsluiting)	FEL54 vervangen; zekering in circuit aanbrengen
Schakelt foutief	Minimum- /Maximum- fail-safe instelling verwisseld	FEL fail-safe keuze correct instellen
Sporadische foutschakeling	Dik zwaar schuim, wilde turbulentie, opgeschuimde vloeistof	Liquiphant in by-pass monteren
	Extreme RFI invloed	Verbindingskabel afschermen
	Extreme vibraties	Ontkoppelen, dempen, vork 90° draaien
	Water in de behuizing	Deksel en wartels vast aandraaien
	FEL52: uitgang overbelast	Schakelbelasting verminderen
Foutmelding	FEL57, gedrag bij inschakelen na netuitval (periodieke testfunctie)	Schakelgedrag FEL57 controleren; procesherstart na netuitval ca. 45 s blokkeren

de – Ergänzung Fehlersuche

Ist das Schaltverhalten der Gabel ungewöhnlich, kann an PIN 4 der Diagnosebuchse die Gabelfrequenz gemessen werden.
Bei den Elektronikeinsätzen FEL51/52/54/55/56/57/58 ist dies eine sinusförmige Schwingung deren Amplitude einen Rückschluss auf den Gabelzustand zulässt.
Bei FEL50A ist aufgrund eines Rechtecksignals nur noch die Gabelfrequenzmessung möglich.

en – Trouble- shooting Supplement

If the switching behaviour of the fork is abnormal, the fork frequency can be measured at PIN 4 of the diagnosis socket.
With electronic inserts FEL51/52/54/55/56/57/58 this is a sinusoidal vibration whose amplitude makes it possible to determine the condition of the fork.
With FEL50A, only the fork frequency measurement is possible due to a rectangular pulse signal.

fr – Additif recherche de défauts

Si la commutation de la fourche est inhabituelle, il est possible de mesurer la fréquence de cette dernière au PIN 4 de la prise diagnostic.
Pour l es électroniques FEL51/52/54/55/56/57/58 il s'agit d'une oscillation sinusoïdale dont l'amplitude permet d'évaluer l'état de la fourche.
Pour FEL50A, le signal rectangulaire ne permet qu'une mesure de la fréquence de fourche.

es – Suplemento para la identificación de fallos

Si el comportamiento de conmutación de la horquilla es anormal, puede medir la frecuencia de la misma en el PIN 4 del interruptor de diagnosis.
Con las electrónicas FEL51/52/54/55/56/57/58 se consigue una vibración sinusoidal cuya amplitud hace posible determinar la condición de la horquilla.
Con FEL50A, sólo es posible medir la frecuencia de la horquilla debido a una señal de impulsos rectangular.

it – Supplemento alla ricerca dei malfunzionamenti

Se le condizioni di commutazione dei rebbi non è normale la frequenza di vibrazione può essere misurata al PIN 4 del connettore per la diagnosi.
Con gli inserti elettronici FEL51/52/54/55/56/57/58 è possibile determinare la condizione dei rebbi anche tramite l'ampiezza dell'onda sinusoidale.
Con FEL50A il segnale è un onda quadra, per cui è possibile valutare solo il valore di frequenza.

nl – Bijlage problemen oplossen

Indien het schakelgedrag van de trilvork niet normaal verloopt kan de frequentie van de vork gemeten worden op pen 4 van de diagnoseconnector.
Bij de elektronica inserts van de FEL51/52/54/55/56/57/58 is dit een sinusvormige trilling waarvan de amplitude een beeld geeft van de conditie van de vork.
Bij de FEL50A is alleen de vorkfrequentie te meten als gevolg van een rechthoekig pulssignaal.

de - Ersatzteile
Elektronikeinsätze

en - Spare parts
Electronic inserts

fr - Pièces de rechange
Electroniques

es - Repuestos
Electrónicas

it - Ricambi
Inserti elettronici

nl - Reserve-onderdelen
Elektronica inserts

FEL51	52002304
FEL52	52002305
FEL54	52002306
FEL55	52002307
FEL56	52002308
FEL57	52002309
FEL58	52006454
FEL50A	52010527

Installationsregel: Bei der Installation ist zu beachten, dass elektrische Betriebsmittel (Elektronikeinsätze) die mit nichteigensicheren Stromkreisen gespeist wurden, grundsätzlich **nicht** mehr mit eigensicheren Stromkreisen zusammengeschaltet werden dürfen.

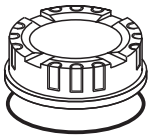
Installation specification: During installation, please keep in mind that electrical resources (electronic inserts) which are powered by non-intrinsically-safe circuits may **no** longer be interconnected with intrinsically-safe circuits.

Directive d'installation : Lors de l'installation, tenir compte du fait que les matériels électriques (électroniques) alimentés par des circuits sans sécurité intrinsèque **ne** doivent plus être connectés à des circuits à sécurité intrinsèque.

Normas de instalación: Durante la instalación, tenga en cuenta que los elementos eléctricos (electrónicas) alimentadas por circuitos no instrínsecamente seguros, **no** podrán estar interconectadas con circuitos intrínsecamente seguros.

Specifiche di installazione: Durante l'installazione è necessario tenere presente che gli impianti elettrici (inserti elettronici) alimentati da circuiti elettrici non a sicurezza intrinseca **non** possono più essere collegati con circuiti elettrici a sicurezza intrinseca.

Installatievoorschrift: Bij de installatie moet erop worden gelet, dat elektrisch materieel (elektronica-units) die via niet-intrinsiekveilige circuits worden gevoed, in principe **niet** meer met intrinsiekveilige circuits mogen worden samengeschakeld.



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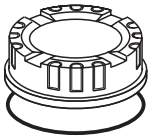
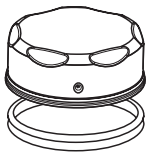
Alu	Alu	52002699
EPDM	Alu (Ex d)	52002698



*

PBT-FR	943461-0000
EPDM	017717-0003



*

1.4301 / 1.4435 *(AISI 304 / 316L)*	943301-0000
MVQ	943304-0000

* Mit Silikonfett oder Graphit schmieren
Lubricate with silicone grease or graphite
Lubrifier avec de la graisse silicone ou du graphite
Lubricar con grasa de silicona o grafito
Lubrificare con olio di silicone o grafite
Met siliconenvet of grafietvet insmeren

de – Gehäusedeckel, Dichtungen

en – Housing covers, seals

fr – Couvercles de boîtier, joints

es – Cubiertas del cabezal, juntas

it – Coperture custodia, guarnizioni

nl – Behuizing deksels, dichtingen

de - Reparatur
bei Endress+Hauser

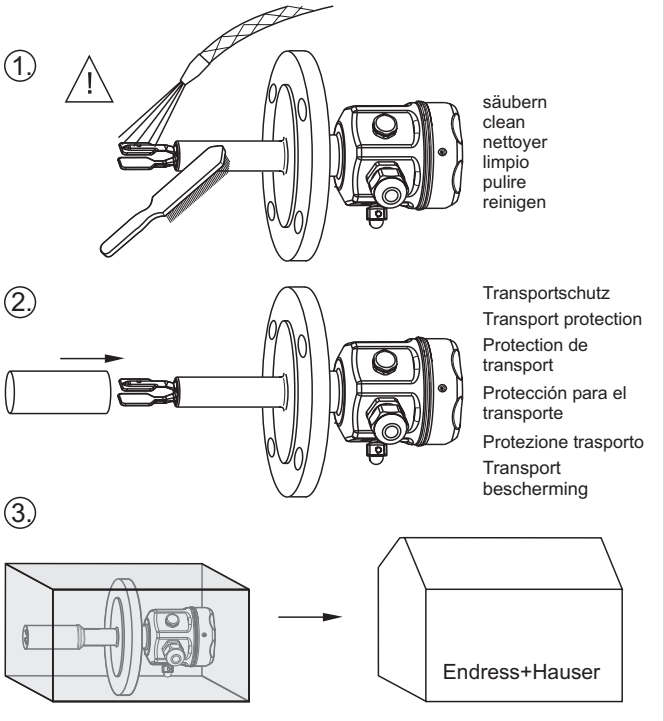
en - Repair
at Endress+Hauser

fr - Réparations
chez Endress+Hauser

es - Reparaciones
en Endress+Hauser

it - Riparare
presso la Endress+Hauser

nl - Reparatie
bij Endress+Hauser



Technische Information / Technical Information / Information technique / Información técnica / Informazioni tecniche / Technische Informatie

TI328F Liquiphant FTL50, FTL50H, FTL51, FTL51H

Betriebsanleitung / Operating Instruction / Mise en service / Instrucciones de funcionamiento / Istruzioni operative / Inbedrijfstellingsvoorschrift

BA141F FEL50A, PROFIBUS PA

Sicherheitshinweise / Notes on Safety / Conseils de sécurité / Notas sobre seguridad / Note sulla sicurezza / Veiligheidsinstructies

XA031F	CE ⟨Ex⟩	II 1/2 G,	EEx d	IIC/IIB
XA063F	CE ⟨Ex⟩	II 1/2 G, II 1/2 D,	EEx ia/ib	IIC/IIB
XA064F	CE ⟨Ex⟩	II 1 G,	EEx ia	IIC/IIB
XA108F	CE ⟨Ex⟩	II 1/2 G,	EEx de	IIC/IIB
XA154F	CE ⟨Ex⟩	II 1/2 G, II 1/2 D,	EEx ia/ib	IIC/IIB
XA159F	CE ⟨Ex⟩	II 1 G,	EEx ia	IIC/IIB
XA182F	CE ⟨Ex⟩	II 3 G, II 3 D,	EEx nA/nC	II

de – Ergänzende Dokumentation

en – Supplementary Documentation

fr – Documentation complémentaire

es – Documentación adicional

it – Documentazione supplementare

nl – Aanvullende documentatie

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